



VOL. 12, No. 1

JANUARY 1958

# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

SMALLPOX VACCINATION IN LATIN AMERICA  
PUBLIC HEALTH ASPECTS OF CHRONIC DISEASE  
AIR POLLUTION

*REPORTS OF EXPERT GROUPS  
NOTES AND NEWS*



WORLD HEALTH ORGANIZATION  
PALAIS DES NATIONS  
GENEVA

The World Health Organization (WHO) is a specialized agency of the United Nations and represents the culmination of efforts to establish a single intergovernmental health agency. As such it inherits the functions of antecedent organizations such as the Office International d'Hygiène Publique, the Health Organization of the League of Nations and the Health Division of UNRRA.

WHO had its origin in the proposal made at the United Nations Conference held in San Francisco in 1945 that a specialized agency be created to deal with all matters relating to health. In 1946 representatives of 61 governments met at the International Health Conference, New York, drafted and signed the WHO Constitution and established an Interim Commission to serve until the Constitution could be ratified by 26 Member States of the United Nations. The Constitution came into force on 7 April 1948; the First World Health Assembly met in Geneva in June 1948 and on 1 September 1948 the permanent Organization was established.

The work of the Organization is carried out by three organs: the World Health Assembly, the supreme body to which all Member States send delegates; the Executive Board, the executive organ of the Health Assembly, consisting of 18 persons designated by as many Member States; and a Secretariat under the Director General.

The scope of WHO's interests and activities exceeds that of any previous international health organization and includes programmes relating to a wide variety of public health questions: malaria, tuberculosis, venereal diseases and treponematoses and other communicable diseases, maternal and child health, mental health, social and occupational health, nutrition, nursing, environmental sanitation, public health administration, professional education and training, and health education of the public. In addition WHO undertakes or participates in certain technical work of international significance such as the compilation of an international pharmacopoeia, the setting up of biological standards and of standards for insecticides and insecticide spraying equipment, the control of addiction-producing drugs, the exchange of scientific information, the drawing up of international sanitary regulations, the revision of the international lists of diseases and causes of death, the collection and dissemination of epidemiological information and statistical studies on morbidity and mortality.

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*The Chronicle of the World Health Organization* is published in English, French, Spanish and Chinese editions. It contains general information on the Organization, its principal activities, the meetings of its expert committees and other advisory bodies, as well as summaries of its main technical publications.

Subscription for 1958	17/6 \$3.00 Sw fr 10.—
Price per copy	1/9 \$0.30 Sw fr 1.—

A specimen number will be sent free of charge on request.

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## **SCHEDULE OF MEETINGS**

- 6-13 January     **Standing Committee on Administration and Finance of the  
Executive Board Geneva**
- 14 January     **Twenty first session of the Executive Board Geneva**  
(approximately  
2-3 weeks)
- 24-28 February **Expert Committee on Medical Rehabilitation Geneva**
- 10-15 March     **Expert Committee on Sanitation of International Airports Geneva**
- 17-19 March     **Regional Seminar on Venereal Diseases, Tokyo**
- 14-19 April     **Study Group on Mental Health Problems of Automation Geneva**

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

# SMALLPOX VACCINATION IN LATIN AMERICA

## Seminar on Smallpox Vaccination

Smallpox is still a public health problem in the Americas although it has been eradicated in some countries. In 1950 the magnitude of the problem led the directors of the Pan American Sanitary Organization to recommend that Member States should develop mass smallpox vaccination and revaccination programmes in their respective national territories the ultimate aim being to eradicate the disease throughout the Americas. Subsequently a special fund was established for the implementation of a continent wide smallpox eradication programme.

In order to encourage the American countries to take action the Pan American Sanitary Bureau which acts as the WHO Regional Office arranged to co-operate with them in planning smallpox vaccination campaigns which in due course would be integrated into the general health services of the respective countries—the ultimate objective being eradication of the disease throughout the hemisphere.

As the first stage of this programme PASB/WHO encouraged the production in the various countries of high quality smallpox vaccine capable of withstanding the climate and the transport conditions prevailing over large areas of the continent and supplied a number of national laboratories with the equipment for producing this type of vaccine. The services of specialists in the preparation of the product were also made available. Technical information on the subject was circulated. Fellowships for training in modern production methods were awarded to the technicians responsible for the production of the vaccine and a laboratory of international repute was appointed to carry out potency, purity and safety tests.

PASB/WHO also made available the services of specialists in the organization and development of vaccination campaigns. To facilitate the preparation and implementation of the campaigns a handbook on small

pox vaccination programmes was prepared and distributed in 1956. It contains information on the various factors to be borne in mind in the planning and organization of vaccination campaigns and on their successive phases. It also contains instructions on vaccination techniques and model forms for use in campaigns.

In some American countries laboratories have been preparing glycerinated and dried vaccines for use in national campaigns and even in some instances for export to other countries of the American continent.

However, as the production and control techniques adopted in the different laboratories varied in certain respects while the control tests carried out by the competent international laboratory brought to light considerable discrepancies between the vaccines they produced (and even between different batches produced by the same laboratory) a seminar was organized for workers engaged in the production and control of the vaccines in the various countries.

The fundamental purposes of this seminar were to permit an exchange of views and experiences to reach an agreement on the advantages and disadvantages of certain technical processes used in production and to establish uniform control methods so as to obtain comparable results. The seminar which also provided an opportunity for discussing laboratory methods for the diagnosis of smallpox and for analysing the results obtained in campaigns with the various types of vaccine was held in the National Public Health Institute, Lima, Peru, from 20 to 25 August 1956. There were nineteen participants and observers from ten American countries and a number of eminent scientists of world repute in this particular field were present in an advisory capacity.

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practical demonstrations of certain production techniques. The *Bulletin of the Pan American Sanitary Bureau*<sup>1</sup> published the papers submitted on the various subjects with a summary of the discussions and the conclusions and recommendations.

The principal communications covered preparation of glycerinated calf and sheep lymph, the use of antibiotics for the destruction of secondary germs, the preparation and application of dried vaccine, the preparation of vaccine in the chick embryo and on tissue cultures, safety, potency and purity testing of the vaccines, principles for the standardization of the vaccines and for laboratory diagnosis of smallpox. We give here under a summary of the views expressed by the experts on some important questions relating to vaccination and of the discussions by the participants in the seminar.

### Selection of animals for lymph production

As a general rule for the preparation of the vaccine lymph, it is preferable to use calves weighing 120-150 kg and of a light colour since the appearance of the vaccine is affected by the animal's pigmentation. Inoculated animals must be perfectly clean, particularly when the lymph is being extracted. It would be interesting to study the advisability of administering antibiotics to inoculated animals so as to obtain lymph with a low content of contaminating bacteria. The incubation period in the calf varies according to the country. It is recommended that the extraction be carried out before the pustules break or dry up. Some laboratories prefer the sheep to the calf for vaccine production as the sheep is less subject to tuberculosis and indeed generally more resistant to disease. It is moreover easier to handle and it is also cleaner since its faeces are solid.

When the sheep is used, the lymph is extracted four days after inoculation. Some 125 g to 150 g of lymph are normally produced from one calf and 100 g from a sheep. Whichever animal is used, care must be

taken to ensure that the scarification is superficial so as to avoid the possibility of the virus becoming adapted to other tissue.

### Use of antibiotics

In his report on dried vaccines, Dr A. Sousa Iglesias points out that although attempts to purify lymph with antibiotics have often given contradictory results, certain conclusions can nevertheless be drawn. First, the bacteriostatic effect of the antibiotics used during the preparation of dry vaccines is only temporary. Moreover, if a massive dose of antibiotic is used, the potency of the vaccine is lowered, sometimes also antibiotics eliminate certain microorganisms while encouraging the growth of others. However, most of the microorganisms which contaminate lymph are sensitive to chloramphenicol. Although penicillin has an antibiotic action on certain adventitious microorganisms, it produces little or no effect on many of them.

### Dried vaccines

Glycerinated lymph, which may be affected or inactivated by high temperatures, is gradually being replaced in hot countries by the more stable freeze-dried vaccines. In South America, centres for the preparation of dried vaccine have been established in several laboratories. In his contribution, Dr D. McClean emphasizes the importance of the studies encouraged by WHO, which are the first to give results relating to the activity of these vaccines in the laboratory and in man under strictly controlled conditions. One of the vaccines studied (that of the Lister Institute of Preventive Medicine) resisted a temperature of 45°C for 64 weeks without any appreciable loss of potency and then gave 100% successful vaccinations. Vaccine lymph may be purified by differential centrifugation which eliminates any fragments of tissue. 5% peptone being added as a protective agent. Those who have had the opportunity of using the vaccine in the field are unanimously of the opinion that once the vaccine has been

reconstituted it deteriorates rapidly at room temperature it must therefore be used immediately or if it is preserved at 0-4°C within 7 days of being reconstituted

### Inactivated vaccines

Vaccination with inactivated vaccine would obviate the disadvantages of administering live vaccine to certain persons. For the present experiments have been limited to animals and according to Dr McClean who has conducted these experiments inoculation of rabbits and monkeys with vaccine irradiated with ultraviolet light makes these animals resistant to the live virus and stimulates the formation of antibodies. In the rabbit, inoculated with two successive doses at a two weeks interval immunity persisted for 22 weeks and was prolonged by booster injections. The ultraviolet dosage and the time of exposure are important; excessive irradiation destroys the antigenic power of the virus.

The cutaneous reactions caused by irradiated vaccine and the titre of the circulating antibodies are less than in the case of a live vaccine and it may therefore be concluded that the irradiated vaccine acts in the same way as a killed vaccine. Experiments in inoculation of chick-embryos with irradiated vaccine in a fortyfold concentration did not reveal the presence of any live particle. This vaccine also lends itself satisfactorily to freeze-drying.

### Vaccines cultured on chick-embryo

The method of preparing smallpox vaccine by culturing the virus on the chorio-allantoic membrane of the chick embryo which was perfected more than twenty years ago has been used for human vaccination by several workers. Dr J. V. Irons and Dr E. B. M. Cook point out that this method has certain advantages. First it is easy to obtain pure vaccine without the adventitious contamination which is almost inevitable when calves are used; secondly large quantities can be produced in a short time and at relatively low cost; thirdly it can be prepared by laboratories which do not have the necessary

facilities for housing livestock. The above mentioned authors have recently seeded the virus in the allantoic sac of embryos on the eleventh day of incubation and in this way have succeeded in cultivating the virus over the whole surface of the chorio-allantoic membrane. By this method about 200 doses of vaccine are obtained per embryo as against 60-65 with the old method in which only a part of the membrane is seeded. In the light of Dr Irons' statement the participants agreed to recommend that laboratories preparing smallpox vaccine try this technique as a means of overcoming any difficulties which might arise from a shortage of animals. It is noteworthy that the 500,000 doses of vaccine made available by the Bacteriological Institute of Chile were cultured on chick-embryos.

### Vaccines prepared on tissue cultures

In his communication Dr McClean mentions a method of preparing vaccine—perfected by Wesslen in Sweden—which is of great potential importance. In this method the virus is cultured on the skin of bovine embryos suspended in amniotic fluid. This vaccine is used in Sweden and there seems every probability that it would be suitable for the preparation of dried vaccine. The cultures are made in Roux flasks. The quantity obtained from the skin of a 3-4 month embryo is the same as that obtained from a calf or sheep. This technique does not require the culture of the cutaneous tissue; the virus is cultured on cells which are still living but no longer growing. From the points of view of sterility and economy this vaccine has the same advantages as that prepared on chick embryo and indeed has one definite advantage over the latter in that it maintains the virus culture on bovine tissue. Dr Else Krag Andersen mentions that in Denmark the virus is cultivated on the liver of two-day-old female rabbits infected intracutaneously.

### Potency testing of vaccines

It is evident that results obtained from everyday vaccinations and from systematic

campaigns are the best proof of the efficacy of a vaccine. Nevertheless preliminary potency tests in the laboratory are essential. Titration methods vary however from country to country and from laboratory to laboratory and different results may be obtained with the same vaccine. This is the reason for the considerable difficulties encountered up to the present in standardizing smallpox vaccines. Not only are there difficulties resulting from qualitative differences between vaccines but very little is yet known of the relation between laboratory results and the results of human vaccination. It is in fact in this particular field that the above mentioned studies carried out under WHO auspices have been of paramount importance. Dealing with this matter Dr Else Krag Andersen reviews the following titration methods: (a) intradermal titration in rabbits; (b) titration by scarification also in rabbits; (c) pock counts on the chorio allantoic membrane of chick embryos; and (d) determination of the cytopathogenic action of the vaccine on tissue cultures.

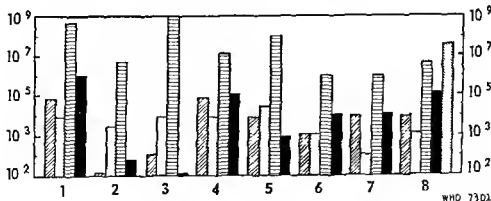
Chick embryo titration i.e. pock counts on the chorio allantoic membrane is perhaps the most promising method. The embryos are inoculated on the eleventh day of incu-

bation with tenfold virus dilutions (5-6 embryos per dilution) and after three days incubation at 36°C a count is taken of the pocks which have developed on the chorio allantoic membrane. The titre is expressed by the number of infective particles per ml of vaccine dilution, each pock being assumed to be caused by one particle of virus. This method in spite of certain disadvantages (such as the convergence of pocks and irregular rates of development) is more accurate than the scarification technique on the skin of the rabbit. It has made it possible to fix the titre which will obtain the highest possible number of successful vaccinations at  $10^8$  IU/ml. However Dr Krag Andersen believes this to be somewhat too strict a standard since higher dilutions have been found satisfactory in certain cases.

Tissue culture titration by determination of the cytopathogenic action of the virus is still in the early stages but this method may be developed both for titrating vaccines and for detecting the presence of contaminating viruses.

The differences in titre obtained with these different methods on eight vaccines are clearly indicated in the accompanying figure. In addition to the techniques mentioned

SMALLPOX VACCINE TITRES OBTAINED BY DIFFERENT METHODS



WHO 73.01

Vaccine dilution

1 Calf (Denmark)

2 Calf (Uruguay)

3 Calf (Ecuador)

4 Buffalo calf (Bandung)

5 Sheep (England)

6 Egg

7 Rabbit liver (experimental use)

8 Skin of calf embryo (Sweden)

Intracutaneous injection (rabbit)

Scarification (rabbit)

Pock count (egg)

Mortality in infant mice

Tissue culture

above the figure also shows the results obtained by determining the minimum lethal dose for two-day-old mice inoculated by the intrapulmonary route. The data give some idea of the complexity of the problem of establishing an international standard of potency for smallpox vaccine—a problem to which WHO is devoting attention.

A number of recommendations and conclusions were approved by the participants in the seminar as follows:

(1) An attempt should be made to obtain lymph and consequently vaccine with a low bacterial content, the ultimate aim being the production of a bacteria free vaccine.

(2) Dried vaccine should be used in campaigns in areas where there are no refrigeration facilities.

(3) Before dispatch every batch of dried vaccine should be tested by keeping samples at a temperature of 37°C for one month after which they should satisfy each country's minimum purity and potency requirements for glycerinated vaccines.

(4) The expiry date should be given for every batch of vaccine counted from the time of distribution and fixed in accordance with local conditions.

(5) Every batch of vaccine after being subjected to full safety and potency tests in the laboratory should be tested in man before general use.

(6) All laboratories producing vaccine should send samples at least twice yearly through the Pan American Sanitary Bureau to a specialized central laboratory. This would be in their own interests and would also be a method of co-operating in studies towards the establishment of an international standard.

(7) Laboratories producing vaccine should also carry out research to improve their vaccines and to develop the use of other sources of virus production.

(8) Since a continent wide programme of smallpox eradication is under way it is essential that public health laboratories in every country be equipped for carrying out smallpox diagnosis tests.

(9) Countries which have not yet eradicated the disease should be recommended to carry out smallpox eradication campaigns in accordance with recommendations of the Thirteenth and Fourteenth Pan American Sanitary Conferences.

(10) From the international epidemiological viewpoint no distinction should be made between smallpox and alastrim.

## PUBLIC HEALTH ASPECTS OF CHRONIC DISEASE

The more rapidly human knowledge expands the greater is the number of fresh problems created. In medicine the advances of the last fifty years have brought about a spectacular increase in life expectancy but this has been paralleled by a rise in the morbidity and mortality from chronic disease. Public health workers are unwilling to accept this as an inevitable consequence, however, and are resolved to make a determined attack on ill health in all its forms and in whatever section of the population it occurs.

It was in this spirit that public health workers from 12 countries as well as a small

number of experts in chronic diseases and related fields met in Amsterdam from 30 September to 5 October 1957 at a Symposium on the Public Health Aspects of Chronic Disease organized by the WHO Regional Office for Europe.

In order to limit the field sufficiently for profitable discussion it was decided to exclude congenital and acquired defects, mental disease and communicable diseases—which have already received considerable attention from public health authorities—and to focus attention on four major disease groups exemplifying particular aspects of the



chronic disease problem. The four groups chosen were malignant neoplasms, diabetes mellitus, cardiovascular diseases and rheumatic diseases. Prime consideration was given to the age group which is important for the diseases of later working life, i.e. 40-64, although it was recognized that none of the chronic diseases under discussion is confined to this age group.

Papers dealing with various aspects of chronic disease—epidemiology, early detection, etiology, treatment, rehabilitation—by experts in the fields concerned were read at the Symposium and served as a basis for the subsequent discussions. Prior to the Symposium a questionnaire on existing morbidity studies, problems and programmes in the field of chronic diseases was sent to the governments of the participating countries and a summary of the replies was circulated in advance to the participants.

### *What is chronic disease?*

A satisfactory definition of chronic disease must incorporate both the medical and the social aspects. The following definition was agreed upon by the Symposium. Chronic disease is an impairment of bodily structure and/or function that necessitates a modification of the patient's normal mode of life and has persisted or may be expected to persist over an extended period of time.

It was not considered either practicable or desirable to suggest a definite period as a minimum for general public health purposes. The chronicity of a disease is determined more by its character than by its duration. Administrative, social and economic considerations are also involved and as new treatments are discovered, diseases which are classed as chronic today will not necessarily remain so.

The public health aspects of disease were taken to include all activities that can be carried out by public and voluntary health organizations, scientific institutions and individual people to prevent and control disease and to promote health. The chronic diseases offer a particularly difficult problem on account of their obscure etiology, insidious

onset and multifarious symptoms. At present not enough is known about their prevalence, natural course and the amount of disability they produce—all factors affecting the importance of a disease as a cause of human suffering and an economic burden on the community. There is evidence, however, that through loss of manpower the chronic diseases have an exceedingly damaging effect on the productivity and welfare of the countries of Europe and that they account for a major part of the total cost of sickness.

### *Prevention of chronic disease*

The ideal way to control the chronic diseases would be to prevent their occurrence either by eliminating the causes or by some form of prophylactic treatment. Unfortunately, only in a few of the diseases discussed at the Symposium is either of these procedures a practical possibility for the time being. Nevertheless, there are certain public health measures that can be taken to decrease the prevalence of the chronic diseases or at least to arrest them at an early stage before disability results.

Prevention in the strict sense of the word—action which removes the possibility that a disease will ever occur—has been termed primary prevention. Action which halts the progress of a disease at its incipient stage and prevents complications has been called secondary prevention. As a rule, primary prevention is possible only if the etiology of the disease is known. A number of etiological factors were considered at the Symposium, including heredity, nutrition, habits of life, environmental, social and economic conditions. Since the etiology of the chronic diseases under discussion is still largely obscure, however, primary prevention is not a practical proposition in most cases.

### *Secondary prevention*

Until more is known about the etiology of the chronic diseases, public health measures must be based mainly on secondary prevention. This implies early detection and diagnosis followed by prompt treatment and rehabilitation. Ideally, periodical health

examinations would serve the purpose of secondary prevention very well but the resources in money and manpower required would be too great for such a policy to be applied to the entire population. Moreover apart from the fact that the average general practitioner is too busy treating the sick to carry out comprehensive health examinations most physicians are still inadequately trained in the preventive aspects of medicine. On the other side it is difficult to persuade people who are apparently well to submit themselves to periodical health examinations.

As a way out of this difficulty many public health workers have turned to the technique of screening. This relies upon a series of tests examinations or other procedures which can be applied rapidly and are designed to provide presumptive evidence of the presence or absence of one or more specific diseases. A screening test is not intended to be diagnostic persons with suspicious findings must be referred to their physicians for diagnosis and treatment. Screening affords a means of bringing the benefits of early detection to large groups of the population. In the United States of America it has been found that, when screening tests are organized on a group basis with proper educational effort it is usual for 80-90% of those eligible to participate.

#### *Multiphasic screening*

Many of the screening tests used for different diseases can be conveniently combined and by a suitable combination it is possible to screen simultaneously for tuberculosis diabetes anaemia syphilis glaucoma hypertension hearing defects and certain forms of cancer and heart disease. This has been termed multiphasic screening. Such a survey does not take very much longer than screening for a single disease and has obvious advantages for the person examined. From the administrative point of view it represents a considerable saving. Only a single campaign of health education needs to be carried out before the screening programme starts and a single record system can be designed to take all the results. The laboratory services can also be readily adapted

to a multiphasic programme thus effecting a considerable saving in personnel.

Screening tests will be successful in the secondary prevention of chronic diseases only if they are properly integrated into the regular medical services of the country. Without follow up for diagnosis and treatment screening tests are useless. The suggestion was made that those administering the screening programme should not only refer persons with suspected disease to their regular physicians but should also ask the physicians to report back their findings.

#### *Treatment and rehabilitation*

The medical care of the patient with chronic disease whether at home or in an institution is predominantly the responsibility of the doctor in direct relationship with the patient. Although there are circumstances in which the admission of a patient to a hospital nursing home or other institution is unavoidable the Symposium was definitely of the opinion that home care should be given preference over institutional care. This means that specialized home-care services must be provided and may also involve minor structural alterations in the home to enable the patient to be properly nursed there.

In the modern treatment of chronic disease great emphasis is laid on rehabilitation of the patient i.e. restoration of as much as possible of any lost function and reintegration of the patient into society. This is a fairly new concept and many physicians are still unaware of the possibilities of rehabilitation in chronic disease. To be of maximum benefit rehabilitation must be begun early—ideally as soon as the diagnosis is made. The provision of the necessary facilities for early detection and treatment is thus an important function of the public health services.

#### *Rehabilitation of the rheumatic patient*

Rheumatism accounts for approximately one tenth of industrial disablement—a figure which has been found to be nearly constant for all countries in both hemispheres in which surveys have been made. The rehabilitation

chronic disease problem. The four groups chosen were malignant neoplasms, diabetes mellitus, cardiovascular diseases and rheumatic diseases. Prime consideration was given to the age group which is important for the diseases of later working life, i.e. 40-64, although it was recognized that none of the chronic diseases under discussion is confined to this age group.

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### *Care of the cancer patient*

Cancer differs from the other chronic diseases discussed by the Symposium in that in certain sites it may be curable if detected soon enough. Early diagnosis and radical treatment are therefore the essential means of control of the disease. The Group recommended the setting up of cancer centres with specialized personnel and technical facilities for the treatment of patients with cancer at an early stage. Such a centre might be a separate entity or a special department of a general hospital.

Where a cure is uncertain or impossible additional services will be needed. Wherever circumstances allow the patient should be treated in his own home under the supervision of his regular doctor who should be able to call upon such nursing and domestic assistance as may be required. If the disease progresses despite all treatment at home or if the patient is quite helpless it is undoubtedly best for him and most economical for the community if he is placed in an institution designed to provide facilities for long term nursing and some treatment. On the other hand it is not desirable for moribund patients to be concentrated in such institutions as the frequent deaths will have an extremely depressing effect on the patients, their families and the nursing staff. Since the average number of bed-days is relatively short for moribund patients it seems economically justifiable as well as more humane to send them to general hospitals. Modern palliative treatment can do much to alleviate the suffering of the incurable cancer patient and should always be available.

### *Social security*

To meet the needs of the patient with chronic disease a comprehensive system of social security should cover the cost of medical care and rehabilitation for as long as required and should provide cash benefits in the case of incapacity for work or invalidity pensions where the incapacity is per-

manent. In the majority of European countries insurance schemes or health services are in operation which provide medical care other than hospital treatment for as long as the patient remains protected or at least for long periods. On the other hand hospital care is usually limited, the maximum duration being usually the same as for cash sickness benefits. After this period has expired the patient is no longer insured until he resumes work liable to insurance. If he continues to be incapacitated however invalidity insurance may intervene with a pension.

The International Labour Office has dealt with the subject of medical care, sickness cash benefits and invalidity pensions in a number of international instruments setting up minimum standards and guiding principles of social security. One of the problems is to establish proper co-ordination between sickness and invalidity insurance. The distinction between curable and incurable conditions has not proved wholly satisfactory however partly because medical science is constantly extending the limits of curability partly because invalidity insurance and sickness insurance often employ different criteria.

The Symposium arrived at the following conclusions:

1. Provisions for medical care should not only include treatment and nursing care services for an adequate period but should be extended to services for the early detection of chronic disease and to rehabilitation. Where rehabilitation is at present provided by social security schemes it is usually limited to post-traumatic conditions. The need for extending this service to chronic diseases as well should be recognized.

2. It is very desirable that fuller co-operation should be developed between the public health services, the social security administrations and any other agencies concerned with the provision of medical and social care.

### *Health education*

Education of the public in the principles of healthy living is an essential public health activity. At the same time it is one of the most difficult aims to achieve since it may

of the rheumatic patient is therefore a public health problem of first importance

Rehabilitation in the full sense must aim at securing a regression of the functional disorders caused by the rheumatic lesions and at teaching patients to make maximum use of the physical capacities left to them. Rheumatic deformities should be prevented and an attempt made to increase or at least maintain articular mobility.

The Symposium agreed that rehabilitation of the rheumatic patient could best be carried out in special centres devoted solely to this purpose. Such centres should be equipped with all the necessary apparatus and facilities for kinesiotherapy—the fundamental basis of rehabilitation—and the various forms of thermal therapy, physiotherapy and hydrotherapy. One of the advantages of such a unit is that it fosters emulation between patients with similar problems. The rheumatic patient has a peculiar psychological outlook conditioned by his physical handicap and the long drawn painful progress of the disease. He may easily become discouraged in the face of the swift rehabilitation of a patient with a broken wrist or even an amputation.

Remedial exercises are fatiguing for the patient. It is therefore in advantage if he does not have the additional strain of travelling backwards and forwards to the centre. Moreover at an in-patient clinic the whole day can be devoted to treatment and rehabilitation and the risk of the patient returning to work too soon is also avoided. Where such centres are not available mobile units may be provided for rehabilitation. With regard to the organization of treatment facilities in general the Symposium endorsed the remarks of the WHO Expert Committee on Rheumatic Diseases.<sup>1</sup>

The final goal of all treatment is vocational rehabilitation and a special vocational guidance service can give valuable help here. Careful clinical and functional observation of the patient from the time treatment is commenced is the basis of all vocational guidance. By keeping an exact record of the results of various types of dynamometric and

psycho technical tests and of the patient's ability to carry out different exercises and movements it is possible to establish a register of aptitudes including all the different types of work which the patient may or may not be allowed to do and these can be set against the activities involved in each trade.

The Group suggested that the three main problems to which WHO and the national health administrations should devote their attention were organization of rehabilitation facilities, occupational forms of rheumatism and their prevention and the re-employment of rehabilitated patients.

### *Care of the diabetic*

It is essential that the diabetic patient should be educated to carry out his own treatment and to be self supporting. Nevertheless regular examinations are necessary not only to observe the progress of the disease itself but also to keep a watch for infections and so called degenerative lesions such as atherosclerosis, retinopathy and nephropathy.

One of the main difficulties is the dietary management of the patient particularly in the diabetic woman of forty or over who has a marked tendency to overweight. Obesity is not a problem of the diabetic patient alone however but is believed to promote the development of other chronic diseases as well. Dietary education might therefore be profitably directed at the general public in countries where obesity affects a considerable proportion of the population.

The Group felt that the medical care of the diabetic patient should be mainly the responsibility of the general practitioner while the public health administration should provide the necessary auxiliary services—nurse, dietician, laboratory technician and possibly social worker. Although part of the medical care and follow up of the diabetic patient needs to take place in the doctor's consulting room, home visiting promotes the chances of successful treatment. Dietary education is usually more effective in the home of the patient and the visiting physician may discover an unhealthy situa-

no conclusive evidence has been produced of the part played by any of these. It is generally assumed that two or more factors are involved and that exogenous and endogenous factors act side by side. The Symposium made the following suggestions for future research:

1 Greater use should be made of epidemiological methods including studies of a more experimental nature e.g. on selected populations or groups in which the prevalence of one particular factor seems to be causally related to the presence or absence of atherosclerosis.

2 Studies should be made on persons who have survived a first attack of coronary occlusion in an attempt to correlate survival time with food habits, smoking, work, family situation, etc.

3 The WHO Regional Office for Europe should instigate research into the reasons for the large differences among European countries in the recorded mortality from atherosclerotic and degenerative heart disease, with the object of discovering whether these differences are genuine or have a diagnostic nomenclatural or statistical explanation. It would be expedient to extend the investigation to other important causes of death such as cancer.

4 In view of the rapidly accumulating evidence of the importance of nutrition—and especially of diets rich in saturated fatty acids—for the development of hypercholesterolaemia and possibly for the high incidence of atherosclerosis in certain countries, particular attention should be paid to this problem when drawing up national and international research programmes.

#### *Research in the social sciences*

The Symposium also examined the possibilities of research in the social sciences. Owing to the complex nature of the problems of chronic disease, the methods of the

social sciences cannot be expected to throw any sudden light upon them, but there was general unanimity about the desirability of more joint research between public health workers and sociologists. Past experience has shown, however, that to be successful such co-operation must be carefully organized. The following recommendations were made:

1 WHO preferably in conjunction with FAO should study the possibility of bringing together public health workers, clinicians, nutritionists, medical sociologists, social anthropologists and social psychologists in order to frame programmes of research into food habits and addiction in relation to chronic diseases and the ways in which they can be changed.

2 Institutes engaged in research on the public health aspects of chronic disease should have available the services of a medical sociologist. If possible a medical sociologist should be appointed as a regular member of the staff.

3 Medical and public health students should be given some instruction in the aims and methods of the social scientist so that they appreciate the contribution the social sciences can make towards public health administration and research.

4 Data already in the possession of medical and non-medical organizations and research institutes on the social aspects of chronic disease—etiology, treatment and medical care—should be turned over to the medical sociologist.

5 In population groups which seem to offer special opportunities for the elucidation of problems relating to chronic diseases, new research projects should be started with the collaboration of medical sociologists. In countries now receiving technical aid, for example, studies might be made of the rapid change in social structure and its effect on the incidence of certain diseases.

mean changing habits and ways of life which have deep roots in the past. It may also mean revising preconceptions about the nature and causation of disease that have long been firmly established within the family or the community.

It must be remembered too that the injurious effects of behaviour patterns are usually remote and that any statistical demonstration of a relation between a pleasurable habit and chronic disease poses for the individual the problem of chance. He will tend to argue that in the operation of chance he will escape and others will be the sufferers. Emotional judgments weigh strongly against intellectual arguments.

As far as chronic diseases are concerned a further difficulty is that the health educator has little sure etiological knowledge on which to base his teaching. Moderation in food, alcohol and tobacco and a reasonable balance between work and leisure and between rest and physical activity are generally accepted as helping to reduce the liability to many chronic diseases or to mitigate their severity. Obesity is believed to predispose to hypertension, atherosclerosis and diabetes, although the Group considered that the causal relationship between diet and atherosclerosis was not sufficiently well established to justify specific recommendations to public health authorities. In the case of diabetes the possible risks of intermarriage might be explained.

## Research

The lack of sufficient scientific knowledge on which to base an effective policy of prevention and control of chronic diseases has already been stressed. The Symposium attached great importance to the need for further research, not only within the medical field but also in the social sciences.

Medical research may be divided broadly into laboratory, clinical and epidemiological research. Of the three epidemiological research is the least used and least understood, yet its techniques are no more difficult and its potential contributions to knowledge no less important than those of the other two methods.

The epidemiological method is essentially statistical, based on the collection and study of numerical data. Sometimes the data are derived from national or local vital statistics, sometimes from observation of special groups of the population. In mortality records the items principally used as a basis for epidemiological study are time trends, sex and age distributions, area differences, occupation, social class and other personal attributes, cohort mortality and loss of expected years of life. A large number of sources of morbidity statistics suitable for epidemiological study are discussed in the third report of the WHO Expert Committee on Health Statistics. During the last decade or so attempts have been made in several countries to organize comprehensive systems of hospital morbidity statistics. Analysis of the clinical records of doctors in general practice has been attempted with encouraging results in England and Wales during the last few years and gives every indication of providing a regular source of morbidity statistics suitable for epidemiological research on an extensive scale.

For chronic diseases of very long duration longitudinal methods of study have been designed. The elaborate registration systems for cancer that have been set up in some countries provide statistics not only on the incidence of the different forms of cancer but also on the prospects of survival for one, two or more years according to sex, age, stage and histology of the growth and the type of treatment given.

Many epidemiological problems are not fully amenable to statistical treatment, however, and it has been said that there is more in epidemiological research than statistics. It is also necessary to bear in mind the possible influence of factors which have not been measured or which do not lend themselves to numerical assessment.

The Symposium gave special consideration to research into the factors responsible for the etiology of atherosclerosis.<sup>1</sup> A variety of factors have been recognized to be of possible etiological significance, but so far

other shale-oil factories iron and copper works phosphate factories carbon bisulfide factories sulfate cellulose plants and electro-chemical factories. Pollution from fluorine compounds had such serious effects on cattle in the Netherlands that some of them had to be slaughtered and in Germany animal losses have occurred in the neighbourhood of factories releasing arsenic compounds and metallic dusts into the air. In Yugoslavia peasants are deserting the village of Rudare near Trepcar on account of the high animal mortality and in the Bor region vegetation has been practically destroyed in a belt 17 km long and 12 km wide. Animals and plants have suffered in the neighbourhood of aluminium factories in Switzerland while in Finland a sulfuric acid plant and some other factories have had to pay heavy compensation for damage to crops and material.

Although the Conference was in general agreement on the reality of the deleterious effects of air pollution on the health comfort and well-being of the community the difficulty of obtaining conclusive proof of a direct relationship was felt to be a serious handicap to effective action. It was pointed out that conclusions drawn from a comparison of mortality and morbidity rates in different countries could be highly misleading. Particular interest was shown in the interview survey methods that had been used in some countries to ascertain how much discomfort and annoyance air pollution causes and its possible relationship to minor illness. There is a wide field here for further research into such questions as the relationship between air pollution and certain well known respiratory and infectious diseases the occurrence of minor illness and discomfort following air pollution and the positive value of fresh air in the maintenance of health. Nevertheless the Conference was satisfied that there was sufficient information available to press for immediate action.

#### Measurement of pollution

The Conference recommended that all countries should make systematic measure-

ments of air pollution and that the apparatus used should be standardized. Measurements taken at the same time and place with different types of instrument give different results. It was felt that some simple but reliable apparatus should be developed—OEEC and other bodies are already working on this problem—and recommended for general adoption. If such an apparatus could be mass produced the cost would be kept to a minimum. Standardization is needed however not only with regard to the apparatus and the physical and chemical agents to be measured but also with regard to the technique and the interpretation of the results. An international glossary should also be compiled to ensure uniform terminology. It was felt that it should be possible even at this stage to reach an internationally acceptable expression of results.

While relatively simple procedures are of value in giving a general assessment of the degree of pollution in an area well-equipped centres with adequately trained staff are essential if a thorough study is to be made. It is important that those engaged in such work should have at their disposal information on the meteorological conditions and particularly on the micrometeorological conditions at the time of measurement. The possible hazards of ionizing radiations in the air should also be borne in mind and routine measurements made.

#### Control measures

There was general agreement that the control of air pollution would never be completely effective without the creation of an informed public opinion. Education of the general public—particularly of the younger generation—was therefore considered to be a matter of the greatest importance.

The Conference felt strongly that in spite of the present lack of basic knowledge about the nature sources and allowable levels of pollutants there was much that could be accomplished immediately. A recommendation is to be sent to all countries on the value of setting up national advisory bodies on air pollution representative of all interested



# AIR POLLUTION A MENACE TO PUBLIC HEALTH

One of the consequences of the industrialization of Europe has been the uncontrolled discharge into the air of increasing quantities of smoke particulate matter and waste gases. Since the War anxiety has been growing about the grave danger to public health represented by this constant pollution of the atmosphere. The WHO Regional Committee for Europe discussing this problem at its 1955 session came to the conclusion that a combined effort by the countries of Europe was required for its solution.

As a first step towards implementing this recommendation a Conference on Public Health Aspects of Air Pollution was convened by WHO in Milan from 6 to 14 November 1957. The Italian Government and the Administration of the Province of Milan generously collaborated in the organization of the Conference. Twenty-one European countries<sup>1</sup> participated and the United States, the European Coal and Steel Community and the Organization for European Economic Co-operation also sent observers. Professor G. A. Canaperia, Director of International and Cultural Affairs, Office of the High Commissioner for Hygiene and Public Health of Italy, was in the chair.

In addition to arranging a series of general meetings at which papers presented by experts were subject to general discussion, the organizers of the Conference set up two working groups: one to study the sanitary and engineering problems involved in prevention of air pollution, the other to consider the public health and administrative aspects. Reports prepared by these two Groups were afterwards submitted to the Conference and the problems requiring further investigation were summarized in plenary session.

## The situation

Air pollution is not only a difficult problem: it is for several countries a new pro-

blem. This statement in the final report of the Conference epitomizes the present situation. A questionnaire circulated to all participating countries before the Conference revealed however that there is widespread recognition of the increasing seriousness of air pollution and of the urgent need to take active measures against it. On the other hand the replies showed a varying degree of administrative and technical control in different countries. Few personnel are specially appointed to deal with the many aspects of prevention and control and training facilities are inadequate. In short none of the participants was satisfied with the present situation and disquieting fears were expressed about the possible long term effects of air pollution.

## Biological effects

Several countries gave striking examples of ill effects on man, animals and plants caused by air pollution. In Belgium deaths from chronic bronchitis are higher in the industrial provinces of Liège, Namur and Hainaut than in other provinces. In the United Kingdom it is estimated that in the Thames Valley smoke polluted fog was responsible for 3500-4000 deaths in four days in December 1952 and that a similar but less severe incident in 1956 caused 1000 additional deaths in Greater London. The health of schoolchildren is reported to have been adversely affected in some districts of Poland where smelting and similar industries are concentrated. A shale oil factory at Kvarntorp in Sweden gives off roughly 12 tons of dust, 200 tons of sulfur dioxide and 1200 cubic metres of hydrogen sulfide in 24 hours. Fatigue and discomfort as well as minor illnesses and respiratory symptoms including bronchitis have been found to be more common among people living near the factory than in the rest of the population. Harmful effects on plant life have also been observed in the neighbourhood of this and

<sup>1</sup> A t Belg m B l g r i D m k F i n l d F a n c e  
Fed r l R p b l c o f G r m y G e c I r e l d I t a l y L e m b o u g N t h l d s N r w y P l a n d P t e l S p a S w e d e n  
S t l d T r k y t h U t d K g d m d Y g o s t

# Reports of Expert Groups

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## HEALTH STATISTICS

The effective planning of public health programmes is to a large extent, dependent on the availability of statistics on the morbidity and mortality caused by various diseases. In areas where health needs are greatest, however adequate health statistics are not always readily obtainable. The collection of health statistics in under-developed areas is accordingly one of the principal subjects treated in the fifth report of the WHO Expert Committee on Health Statistics which met in Geneva from 10 to 14 December 1956. The report also covers such topics as health indicators, morbidity statistics, cancer statistics, and the work of national committees on vital and health statistics.

### Collection of health statistics in under developed areas

The need for methods of vital and health registration suited to areas in various stages of development was stressed by the Expert Committee on Health Statistics in 1954 and by the Conference for the Seventh Revision of the International Lists of Diseases and Causes of Death in 1955. It was with particular interest therefore that the Expert Committee on Health Statistics noted the report of a seminar on vital and health statistics convened in Brazzaville in November 1956 by the WHO Regional Office for Africa and the Commission for Technical Co-operation in Africa South of the Sahara (CCTA). The purpose of the seminar was to review the availability and coverage of health statistics in Africa and to give statisti-

cians in the region the opportunity to meet and discuss problems of common interest.

The Committee welcomed the convening of this seminar as an important step towards the improvement of vital and health statistics in the African continent. It went on to recommend that in under-developed areas efforts to improve the collection of vital and health statistics where some kind of administrative machinery is already available should be supplemented by attempts to establish registration systems in places where no information whatsoever exists. The fact that in a number of areas a complete and adequate registration system cannot be organized for the time being should not exclude the establishment of simple registration systems which could at least provide information on the natural growth of indigenous populations. The Committee also endorsed earlier recommendations for the establishment of short lists of causes of death suitable for use in areas where auxiliary medical personnel exist as well as lists to be used in places where only lay sources of information such as ministers of religion, administrative officials or even village chiefs are available.

Methods of collecting health statistics will naturally vary according to local conditions but there should at least be a census of the population and a registration of births and deaths. If it should not be possible to undertake a complete census or registration for the moment a census taken on a sampling basis or the creation of small registration areas within a particular territory would still be useful. At a later stage certification of causes of death and the collection of morbidity statistics could be introduced. The goal should be the organization of statistical services in agreement with internationally recommended principles.

parties Public health personnel sanitary and chemical engineers industrialists and workers in related fields—meteorologists town planners and architects—must be brought together to find the most satisfactory solutions

In a number of countries engineering control measures are already functioning well but there is still much that could be done. It was the unanimous opinion of the Conference that prevention is better than cure and that efforts should therefore be concentrated on controlling pollution at the source. Identification measurement and of course control of a pollutant can be carried out most effectively at the point of production in the industrial plant or in the chimney stack before it reaches the outside air. It was realized that there are some types of industry in which no practicable control measures are possible at present. A valuable step would be taken however if all new industrial establishments of designated categories were required to introduce suitable devices for the routine sampling of aerial effluents at their point of discharge. In this way a further increase in the number of industrial sources of pollution could be prevented.

Not only industrial effluents but also the exhaust gases of motor vehicles contribute largely to atmospheric pollution. A recent study in Paris showed that in the summer months the fumes given off by motor vehicles accounted for 70 % of the total atmospheric pollution. It was therefore gratifying for the Conference to learn that some motor car manufacturers are modifying their engine designs in order to lessen the amount of pollution caused. The use of devices such as catalysts after burners and mechanical fuel regulators seems to offer considerable promise for the future.

## Legislation

It is unlikely that persuasion and education alone will be sufficient to secure an adequate reduction in pollution without some

means of enforcing control measures. At present the introduction of the necessary legislation is hampered by the lack of specific knowledge on the precise effects of air pollution. The Conference felt however that the evil results of air pollution are already sufficiently evident to justify immediate action including where necessary legislative measures. It was recommended that national legislation should be kept sufficiently flexible to allow adaptation to meet local requirements.

## Conclusion

Air pollution constitutes an increasing but avoidable hazard to the health and well being of the community. Much information is urgently needed on its precise effects on man animals and plants and on the most satisfactory means of control. Nevertheless sufficient is already known to justify immediate action including the education of public opinion the setting up of national advisory bodies the training of suitable personnel for research and control routine measurement of pollution and a wider use in industry of the control devices at present available backed if necessary by suitable legislation. There is a pressing need for standardization of measuring apparatus and techniques and an international glossary of terms used in work on air pollution would be valuable. The Conference recommended that WHO should arrange for the collection translation condensation and dissemination of information on air pollution including as a first stage the compilation of a list of various organizations and associations concerned with all problems of air pollution. Proposals were also made for a number of research projects. A WHO Expert Committee on Air Pollution met in November to study the problem further. A start has thus been made with the international co operation advocated by the WHO Regional Committee for Europe the ultimate aim is to safeguard the health and welfare of the peoples of Europe against the harmful effects of air pollution.

# Reports of Expert Groups

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<sup>1</sup> WHO Hlth Org. Jr. An. Rep. Ser. 1957, 133, 2<sup>nd</sup> p. and Price \$2.30 or 5/- f. 1/- Pu. lished in English, French and Spanish.

<sup>2</sup> Unpublished document CCT WHO/STAT/56.38 Rev. 1

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on morbidity and provided due caution is exercised a great deal of knowledge of the prevalence of sickness in a community can be gained from them. In the collection of hospital statistics a distinction should be made between the residents and non residents of an area so as to relate the data more closely to the population at risk. The Committee recommended that WHO study the forms used for recording hospital morbidity statistics in different parts of the world and analyse the definitions of terms and rates currently used in these statistics. The purpose of these measures would be to pave the way for the international comparability of statistics based on hospital morbidity records.

Several factors have to be taken into account in the interpretation of morbidity statistics as distinct from mortality statistics, namely that there is no clear demarcation between health and sickness; that the onset or termination of sickness may be indefinite; that sickness may last over widely varying periods of time; and that it may recur in the same individual. The Committee recommended that morbidity statistics be accompanied by clear statements of their purpose, and the definition of sickness applied in their compilation, whether they relate to sickness beginning within the period of observation, to sickness current during this period, or to duration of sickness, the disease or diseases to which they relate, the time at which a period of sickness is regarded as having begun or terminated (admission to or discharge from hospital, cessation or resumption of work), the period of observation, and the denominator (as for example the population at risk).

### Cancer statistics and registers

For the proper assessment of cancer treatments a precise classification of tumours by site, histological type, and stage is necessary. The Committee therefore recommended that WHO extend the publication of statistical studies on different types of cancer, increase the distribution of relevant information—particularly on statistical methodology applicable to this field—and continue its efforts to improve the classification of tumours.

It was the view of the Committee that the results of cancer treatment on a wide scale could best be assessed by means of cancer registers. The main purpose of these registers should be to obtain information on the incidence of cancer according to the site and type of the primary growth, and to follow up cancer patients in order to ascertain their period of survival. For such information to be adequate it is essential that there should be close co-operation between hospitals treating cancer patients and statistical departments recording the causes of death.

In connexion with the forthcoming meeting of a Sub-Committee on Cancer Statistics<sup>6</sup> the Committee reviewed the work of the previous Sub-Committees on Cancer Statistics, as presented in their two reports<sup>6</sup> as well as developments in the field of cancer statistics over the past few years. These include the establishment of cancer registers in several countries, progress in the histological classification of neoplasms, new techniques for ascertaining the incidence and prevalence of cancer, the extension of statistical studies of the etiology of cancer by relating morbidity and mortality statistics to ethnic, climatic, nutritional and other environmental factors, and the changes introduced in the International Classification of Diseases at its seventh revision.

### National committees on vital and health statistics

The establishment of national committees on vital and health statistics was recommended by the Conference for the Sixth Revision of the International Lists of Diseases and Causes of Death (Paris, 1948); this recommendation was endorsed by the First World Health Assembly. The main purpose of these committees—of which there are now 33—is to facilitate the exchange of information and views between the various national agencies responsible for the collection of vital and health statistics and, in general, to improve the quality and usefulness

<sup>6</sup> See p. 5 of the issue of the *Chronicle*  
of the W.H.O. for Jan. 1950, 25, 17, 1951, 53, 43.

The training of statistical workers for under developed areas was also discussed by the Committee. These workers fall into three main categories (a) statisticians with university training including specialization in health statistics (b) intermediate staff such as record keepers local registrars hospital statisticians etc. and (c) clerical staff. Plans for their training should take into account the special needs of the area to which they will be assigned. The Committee considered that in general personnel of type (a) should have the opportunity through fellowships of studying at specialized centres abroad while international regional training courses might be organized for personnel of types (b) and (c).

### Training handbooks

For the training of health statistical workers in general the Committee recommended that WHO prepare handbooks on such subjects as coding for mortality and morbidity statistics reporting of communicable diseases principles and systems of health statistics and recommended procedures for hospital statistics including the application or adaptation of the International Classification of Diseases.

### Health indicators

Health including demographic conditions was the first of the components of levels of living listed in the report<sup>3</sup> of the Joint Committee on International Definition and Measurement of Standards and Levels of Living convened in 1953 by the United Nations in collaboration with ILO and UNESCO. After examining the indicators proposed by previous committees and study groups—notably the Study Group on the Measurement of Levels of Health which met in 1955<sup>4</sup>—as measures of this component the Expert Committee on Health Statistics recommended the experimental use of the

proportional mortality ratio over 50 (deaths at 50 years of age and over expressed as a percentage of total deaths) as a comprehensive health indicator. The Committee also stressed the utility as a specific health indicator of the infant mortality rate—and in particular the late infant mortality rate (from 1 to 11 months) which though not so widely available as the infant mortality rate is less influenced by pre natal and intra natal causes of death. The Committee considered the death rate from communicable diseases to be rather limited for the purpose of measuring levels of health because in many areas medical certification of causes of death is unreliable or does not exist. Alternatively the total death rate in the 1-4 age group might be tried as a specific indicator where accuracy of age recording justifies its use. The Committee also considered that family living studies and family health surveys could provide valuable data for the local measurement of levels and trends of health.

### Morbidity statistics

The Committee discussed the value of sickness surveys, general practitioners' records and hospital records as sources of information on which morbidity statistics can be based. Surveys covering either a whole population or a representative sample are a useful means of obtaining morbidity data and in some cases the only one; they should however be restricted in scope and duration and their aims should be clearly defined. The records of general practitioners can be used to complement other sources of morbidity statistics and may, in certain conditions, provide a more complete picture of morbidity from the less serious and non-disabling complaints than is available from hospital records.

There are two principal limitations in the use of hospital records as a measure of morbidity in a community: firstly the population exposed to risk may not be known and secondly the types of diseases treated in hospitals are not necessarily representative of the total morbidity of a community. Nevertheless for some parts of the world hospital statistics are the only source of information

mum. No effort should be spared to make the work of the centre known to the outside world through the press and radio by arousing the interest of influential local residents and by encouraging local volunteers to work there. The latter's favourable reports can help towards the acceptance of the treatment centre by the community.

In organizing treatment respect for the individual must take precedence over every other consideration. Mental patients are much less dangerous than is supposed and in most cases there is no justification for the security measures which turned the old-fashioned asylum into a form of penitentiary. The proper therapeutic atmosphere on which successful treatment depends can only be based on an attitude of trust.

In addition to the care of hospitalized cases the psychiatric treatment centre could undertake other preventive work through out-patient clinics and mobile services. This would have the advantage of keeping the medical team in contact with the general public and of allowing the patient to stay in his normal surroundings.

There is no doubt that a psychiatric treatment centre organized on these lines would enjoy high prestige in the community and that its services would be in considerable demand. In particular it would probably be asked to deal with a large number of chronic or incurable cases never previously notified. How can the centre meet obligations of this kind without neglecting its preventive activities? While it is true that this difficulty will disappear as therapeutic progress reduces the number of new cases the immediate problem will certainly exist and in solving it priority will have to be

given to preventive action and early treatment of recent cases.

### Status of the mental health team

The effectiveness of the psychiatric treatment centre whether curative or preventive will always depend to a large extent on the team spirit and morale of its staff. The medical and nursing staffs of psychiatric establishments whose task it is to lead their patients back to normal social life are in danger by the very nature of their work of losing touch with normal social life themselves. In order to avoid an isolation which is dangerous from both the professional and human viewpoints and to stimulate the interest of the staff there should be plenty of refresher courses, information meetings and contacts of all kinds with the outside world. The report emphasizes the fact that the more the members of the team in a psychiatric treatment centre feel that others are aware of the usefulness and value of their work, the greater will be their satisfaction in it. It is essential for the morale of the medical team to be good for this will undoubtedly have favourable repercussions on the patients.

\*

The organization of a psychiatric treatment centre adequately equipped for preventive work is only a first step towards the prevention of mental disorders. Etiological research will make it possible to work out increasingly effective preventive methods already present knowledge of certain easily identifiable pre-psychotic conditions could be put to valuable use in the systematic detection of new cases.

## OCCUPATIONAL HEALTH

As a result of growing industrialization occupational health problems are assuming increased importance and urgency. So many clinical cases now come within this particular field of medicine that no physician can do effective work without some knowledge of it. The third report of the Joint ILO/

WHO Committee on Occupational Health<sup>1</sup> is principally concerned with training in occupational health both for general practitioners and future specialists in this field.



of such statistics. The Committee recommended that WHO continue its efforts to foster the establishment of national committees of this type and that regional or inter-

regional conferences on health statistics be held from time to time with the technical co-operation of WHO and the active participation of national committees in the area.

## PREVENTIVE WORK IN MENTAL HEALTH

Although its value in general medicine is now widely recognized preventive action has been greatly neglected as far as mental health is concerned. Even in countries with well developed services for psychiatric treatment preventive facilities are still embryonic and completely inadequate. The fact that in some European and North American countries about 40 % of hospital beds are occupied by mental cases shows the danger of this situation.

It is obvious that measures for the prevention of mental disorders must be organized without delay but it has yet to be decided which of the health services can best undertake this task. This problem is considered in the fifth report of the WHO Expert Committee on Mental Health which discusses in particular how and to what extent the psychiatric hospital can become a centre for preventive work.<sup>1</sup>

### From treatment to prevention

In preventive work more than in any other health activity the support of public opinion is a prerequisite for success. This is an essential psychological condition for faced with indifference even the best conceived preventive measures cannot be expected to succeed. There is no doubt that for a long time public prejudice against psychiatry was very strong indeed. The frequent absence of a clear cut diagnosis, the length and costliness of treatment and the low proportion of cures aroused general scepticism and made preventive action and even early treatment practically impossible.

In recent years however there has been

some change of attitude because psychiatrists have been obtaining better results owing to greater knowledge of mental diseases and to the application of new methods of treatment to mental patients. The psychiatric hospital is no longer considered as a place where people are put out of the way or as a last desperate resort. More and more patients are voluntarily undergoing hospital treatment in the early stages of mental illness and the resultant number of cures is in turn accelerating the development of preventive work.

In view of this connexion between effective hospital treatment and successful preventive work it would seem fitting that both should be under the direction of a single body for example the psychiatric hospital service.

### Structure of the hospital centre

Certain conditions must be fulfilled if a psychiatric treatment centre is to make a success of its twofold function of prevention and cure.

Instead of being isolated and cut off from the outside world like the old fashioned asylum it should be near—or even in—an inhabited area and consist of one or more medium sized buildings enjoying as much light and air as possible. An effort should be made to avoid the massive prison like type of architecture which was partly responsible for the horror inspired by the institutions of other days.

The psychiatric treatment centre should break away from any suggestion of isolation since this can only be harmful. It should adopt an open door policy visits should be encouraged and formalities for entering and leaving should be reduced to a mini-

twelve intervening years improvements have been made in the techniques for preparation of yellow fever vaccine and it has become necessary to make provision for administering yellow fever vaccine by cutaneous scarification. More detailed descriptions of certain potency and safety tests were also felt to be necessary.

The research carried out by various institutes over a period of several years is now sufficiently advanced for new standards to be recommended in place of the old ones. To this end an Expert Committee on Yellow Fever Vaccine was formed and its report has just appeared.<sup>1</sup>

The recommended revision of the UNRRA standards is set out in detail in an Annex to the report. The three parts of this Annex describe the proposed potency requirements, the proposed safety requirements and the recommendations to be made for the manufacture of yellow fever vaccine. Separate requirements are formulated for vaccine administered by injection and by scarification.

The following points are made in the body of the report:

#### Manufacture of the vaccine

The standards established in 1945 included details of manufacturing procedures thereby hindering manufacturers in the development of new methods. The Committee approached this question in a more liberal spirit and considered that the minimum requirements while fulfilling their purpose should impose as few restrictions as possible on manufacturers of vaccine wishing to improve and develop their products. It expressed the hope that if a new type of vaccine should be developed and prove satisfactory the minimum requirements (recommended and described in its report) would be modified with out delay so as to provide for such a vaccine.

#### Vaccination by cutaneous scarification

The 1945 standards made no mention of this method of administering vaccine which

has been used very widely and with notable success in French African territories so that at the present day practically no cases of yellow fever are observed there. It is an effective and inexpensive method. The vaccine can be prepared by culture of the virus in mouse brain using either the Dakar or the 17D strain. In the Committee's opinion the local authorities should be left to select the strain in the light of the prevalence of the disease and the resulting morbidity. It also emphasized the fact that although vaccination by scarification may be performed by auxiliary personnel it should be supervised by medically qualified staff and stated that as far as was possible and reasonable vaccine administered by scarification should pass the same safety tests as vaccine given by subcutaneous injection.

#### Mouse protection test for yellow fever

This test is more specific than other serological tests for the detection of yellow fever antibodies. The Committee felt that the methods to be used for survey purposes should be sufficiently stringent for positive results to be accepted with considerable certainty and it recommended the adoption of a reference protection test (the technique of which is described in an Annex to the report) for use in serological investigations of primate sera. The Committee recommended that WHO should study the possibility of establishing an international reference preparation of a yellow fever immune simian serum and of making available a pool of human sera non immune to yellow fever. Both these reference sera should be non immune to other Group B arthropod borne viruses in order to eliminate complications due to cross reactions. On rare occasions the serum of a person infected by a virus related to that of yellow fever may give a positive reaction in a yellow fever protection test.

#### Post vaccinal encephalitis

In Europe and Africa cases of encephalitis although rare continue to be reported following vaccination both with the 17D

<sup>1</sup> *Wld Hlth Org Wkly Rep Ser* 1957 136 1 p. sec. Price 1/9 30/30 or 5/- 1/- Published in En. lish, French and Spanish.

and with the ways in which such training can be provided

According to the Committee every physician should be acquainted with at least the forensic aspects of occupational medicine the most common occupational diseases and the repercussions which industrial employment may have upon other common non occupational diseases These subjects could be taught during the final year of medical studies In this connexion the Committee strongly advocated the institution of university chairs of occupational medicine—still far too rare even in industrialized countries

It was also felt that the 'part time industrial physician' who regularly devotes some of his working hours to a particular factory or establishment should be better prepared for his task he should be required to make a thorough study of his particular industrial sector and to acquire practical knowledge of the treatment of employees at their place of work Such further training could be provided through seminars refresher courses or intensive practical work courses of limited duration which would not involve the award of a diploma though participants might receive a certificate

Specialists in occupational health on the other hand in addition to having a first class training in general and public health medicine should be thoroughly acquainted with the pathological psychological and sociological problems relating to their speciality They should also be sufficiently

familiar with the details of the technical and administrative structure of industrial undertakings to be able to collaborate with the other specialists (chemists occupational guidance officers administrators etc) responsible for working conditions in industry or for the organization of the work itself The report emphasizes the importance of team work by the various technicians only by this means will it be possible for each sector to make its problems known and to adapt them to those of the medical service

The highly specialized training of the full time occupational health physician will call for at least a one year post university course in either an occupational health institute or some other establishment competent to award a special university diploma Such training should not be merely theoretical it should also include practical work in the various industrial sectors and thorough study of the most urgent local problems of occupational health

The second part of the report is devoted to study of the scope and organization of occupational health institutes and their educational preventive and curative roles According to local conditions such institutes may be attached to universities to public health services or even to certain industrial undertakings The report enumerates the various services which should be provided in these institutes and an annex gives a list of the necessary staff for each service with respect to three different types of institute

## REVISION OF STANDARDS FOR YELLOW FEVER VACCINE

Every international traveller from a zone in which yellow fever infections occur to a yellow fever receptive area must carry a valid certificate of vaccination against yellow fever No certificate is considered as valid however unless the vaccine employed has been approved by the World Health Organization This provision which is contained in the International Certificate of Vaccination or Revaccination against Yellow Fever (Annex

dix 3 to the International Sanitary Regulations adopted by the World Health Assembly in 1951) was already embodied in a slightly different form in the 1944 International Sanitary Convention for Aerial Navigation In this Convention UNRRA played the role which subsequently devolved upon WHO and established compulsory standards for yellow fever vaccine These standards have been applied since 1945 but during the

operations with the same insecticide might be a waste of time and money. Consequently the importance of finding out whether resistance has developed among the focal strains of disease bearing insects cannot be over emphasized.

In Taiwan where insect-control campaigns have been in operation since 1948 insecticidal tests have recently been carried out on a number of insects of medical importance and the results will shortly be reported by S Y Liu in the *Bulletin of the World Health Organization*. In these tests the susceptibility to DDT of six species of *Anopheles*, one species of *Culex*, one species of *Aedes* and two subspecies of *Musca domestica* and to gamma BHC of a species of *Cimex* was investigated.

Of the various anophelines examined (*A. minimus*, *A. hyrcanus sinensis*, *A. ludlowi*, *A. maculatus*, *A. tessellatus* and *A. subpicatus indefinitus*) *A. minimus*—the main malaria vector of the island—was found on the whole to be the most susceptible and *A. h. sinensis* the most tolerant. Strains of both these species from certain localities however showed a statistically significant difference in tolerance when compared with strains from other localities though whether this tolerance can be regarded as developed resistance remains to be ascertained.

The larvae of a strain of *Culex fatigans* reared from eggs collected from a village which had repeatedly been sprayed with DDT were found to be far more tolerant to DDT than the larvae of a laboratory colony whose ancestors had been collected about 18 months earlier from the same village.

An interesting result was obtained in the case of *Musca domestica*. Two laboratory colonies of *M. d. vicina* were found to be considerably more tolerant to DDT than a normally susceptible strain of *M. domestica* from England although the ancestors of one of the laboratory colonies came from a village that had not been sprayed at the time of collection. This puzzling phenomenon has not as yet been satisfactorily explained.

As to the susceptibility to BHC of *Cimex hemipterus*, no significant difference was found between three strains, two of which

had previously been exposed to mixtures of DDT and BHC and one of which had not.

### Preventive aspects in the teaching of physiology

In recent years governments and academic circles throughout the world have shown increased interest in preventive medicine and this has been manifest in both economically under developed and well-developed countries. While certain measures can be taken to strengthen preventive medicine services immediately their full development can be obtained only through an adjustment in the education of the future generation of medical and public health workers.

WHO recognizes the importance of studying the possibilities and consequences of teaching preventive medicine to undergraduate students. Physiology is one of the principal pre-clinical subjects which might usefully be studied in connexion with preventive medicine and a WHO Study Group on the Preventive Aspects in the Teaching of Physiology met in Geneva from 2 to 7 December.

The following experts took part in this meeting: Dr E W H Cruikshank (United Kingdom), Dr I Gillman (Union of South Africa), Dr Magnus I Cregeresen (USA), Dr Einar Lundgaard (Denmark), Dr W Missuro (Poland), Dr Jean Posternak (Switzerland), Dr W R Spurrell (United Kingdom) and Dr G Payling Wright (United Kingdom).

### Expert Sub-Committee on Cancer Statistics

A WHO Expert Sub-Committee on Cancer Statistics met in Geneva from 9 to 14 December to make a critical analysis of methods for ascertaining the prevalence of cancer and particularly the system of cancer registries which is being applied in a growing number of countries. It also considered progress made and still required in the nomenclature and statistical classification of malignant neoplasms and in the classification of the clinical stages of cancer for a proper assessment of the results obtained by

strain and the mouse brain strain. It has been noted that these cases tend to occur in groups either with regard to time or to place although in most cases it has not been possible to establish a relation between the cases and specific lots of vaccine. The age of the persons vaccinated seems to be one of the main factors since the majority of the encephalitis cases occur among infants under one year old. For this reason the Committee recommended research on practical methods other than vaccination of protecting infants against yellow fever. It was pointed out that what is most urgently needed is a method which would make it possible to protect—even temporarily—an infant on an international journey.

### **Creation of a central laboratory**

Any laboratory manufacturing yellow fever vaccine should be able to conduct safety tests on its own vaccine seed lots. Nevertheless while expressing this view the Committee recognized that it would be advantageous to have a central laboratory capable of providing seed lot virus in sufficient quantity. Such a laboratory could carry out the safety tests with greater accuracy and prepare seed lots under the best possible guarantee; it could also serve as a yellow fever vaccine research centre. The Committee recommended that WHO should consider designating a laboratory for this purpose.

### **Research**

The Committee recommended research on a number of subjects including

(a) the effect of desiccation and of varying conditions of storage on the characteristics and genetic properties of modified yellow fever virus used for vaccination

(b) practical methods other than vaccination of protecting infants against yellow fever

(c) the incidence and characteristics of antibodies cross reacting with yellow fever virus and the development of methods whereby such cross reactions could be detected or eliminated

\* \* \*

### **Definitive text of the revised requirements**

While formulating its recommendations for revised requirements for yellow fever vaccine the Expert Committee was guided by the wish to establish a pattern on which recommended requirements for other vaccines might be based and it proposed that its recommendations should be further studied and if necessary amended. A Study Group on Recommended Requirements for Biological Substances has since discussed general principles for formulating international recommendations and has made proposals for reaching definitive texts. Before implementation the revised requirements for yellow fever vaccine will be scrutinized in the light of these more general proposals. In the context of this broader project of formulating recommended requirements for biological substances the requirements for yellow fever vaccine remain a very special case because they will be the basis for the international validity of a vaccination certificate.

## ***Notes and News***

### **Insecticide resistance in Taiwan**

The increasing tolerance of vector and nuisance insects to DDT and BHC—the insecticides most commonly used in insect control campaigns—is a problem that today confronts public health authorities in many

parts of the world. No longer now is it reasonably certain that control will be achieved by spraying with residual insecticides. While some strains retain their susceptibility to a particular insecticide for a considerable period others quickly develop resistance so that to continue spraying

co-ordination and plans for the future. The Board also considered the question of supplies and equipment and various administrative and technical problems.

The meeting of the Antimalaria Co-ordination Board was followed by a Malaria Symposium held in Bangkok under WHO auspices from 13 to 20 December. The participants included members of the malaria services of Afghanistan, Burma, Ceylon, India, Indonesia, Malaya, West New Guinea, Philippines, Taiwan (China) and the Territory of Papua and New Guinea, as well as United States International Co-operation Administration representatives from several of these countries and territories and representatives of UNICEF. The WHO representatives at the meeting of the Antimalaria Co-ordination Board together with field staff from various countries in the South-East Asia and Western Pacific Regions also took part. Dr A. Gabaldón from the Venezuelan Malaria Division was invited by WHO to attend as a consultant.

The main subjects of discussion at the Symposium were surveillance techniques in malaria eradication programmes, the problem of residual foci of transmission, chemotherapy in malaria eradication and the present position regarding susceptibility and resistance of vector species to insecticides.

Spraying techniques including dosage

frequency, formulations, spraying equipment and schedules were also discussed. Emphasis was laid on the planning and inter-country co-ordination of eradication programmes.

### Health education seminar to be held in Iran

Greatly expanded health education services are needed in almost every country of the Eastern Mediterranean Region to keep pace with the rapid development of the public health services. In view of this, the WHO Regional Office for the Eastern Mediterranean has decided to hold a seminar for health educators and others interested in the improvement of health and welfare in the Region. The seminar will take place in Teheran from 1 to 14 November 1958 on the invitation of the Government of Iran.

At a meeting in Alexandria in November, the Planning Committee for the seminar suggested that between thirty and forty health workers from the various countries in the Region should be invited to attend, as well as representatives from other interested groups and United Nations specialized agencies. The aim of the seminar will be to define the contribution that the health education of the public can make towards the solution of health problems and to discuss ways of encouraging health workers of all kinds to take part in health education.

## People and Places

### Trachoma research in Tunisia

An Ophthalmological Centre has been opened in Tunis as part of a programme for the control of trachoma and associated conjunctivitis. The programme is a development of the trachoma control campaign carried out by the Tunisian public health authorities with assistance from UNICEF and WHO between 1953 and 1956.

At the request of the Tunisian authorities, WHO has appointed a consultant — Dr Mario Tazzio of Italy — to advise on the conduct of a longitudinal research at the Centre for a period of two years, starting in October 1957.

Dr Tazzio has special experience of this type of work having served from 1951 to 1957 on the

trachoma research team of the Harvard School of Public Health, both in the United States and in Saudi Arabia.

### Appointments to a typhoid project

The anti-typhoid campaign started in Liberia in 1953 with WHO and UNICEF assistance is continuing successfully. Dr Herbert Dirckze, who has been Senior Medical Officer of Health (Epidemiology) Department of Health, Colombo, Ceylon, for the past three and a half years, was recently assigned to this project as a WHO Medical Officer.

Dr T. Rao, who for some years has been in charge of typhoid eradication in Hyderabad, India, has joined the international staff of the WHO-assisted typhoid campaign in India.

the various methods of treatment. Finally it suggested lines of epidemiological investigation concerning cancer and particularly differences in frequency of its various forms which might be due to specific environmental conditions.

Dr Percy Stocks, Senior Fellow of the British Empire Cancer Campaign, acted as WHO consultant for the meeting. The following experts were invited to take part: Dr J. Clemmesen, Director, Danish Cancer Registry; Dr P. F. Denoix, Director, Gustave Roussy Cancer Institute, Villejuif, Paris; Dr H. F. Dorn, Chief, Biometrics Branch, National Institutes of Health, USA; and Dr W. P. D. Logan, Chief Medical Statistician, General Register Office, London.

#### Environmental sanitation seminar

A WHO seminar on rural water supplies was held in Singapore from 2 to 20 December for public health administrators, health inspectors and engineers attached to public health services or public works departments of certain countries and territories of the Western Pacific Region. Participants were invited from Brunei, Cambodia, Federation of Malaya, Hong Kong, Laos, North Borneo, Sarawak, Singapore, Portuguese Timor and Viet Nam. Through the WHO Regional Office for South East Asia, health officers from the neighbouring countries of Indonesia and Thailand were also invited to take part.

This was the second of a series of three zonal seminars on environmental sanitation held by the WHO Regional Office for the Western Pacific. The first, covering a different group of countries, was held in Taipei, Taiwan (China) in 1956 and dealt with the collection, disposal and utilization of organic wastes.

Professor F. E. Bruce of the United Kingdom visited various countries in Zone II on behalf of WHO to assist with preparations for the seminar. Professor Bruce, who is Reader in Public Health Engineering at the Imperial College of Science and Technology, London, has twice visited Greece as sanitary engineering consultant for the WHO Regional Office for Europe.

#### India holds seminar on communicable eye diseases

A national seminar on communicable eye diseases sponsored by the Indian Council of Medical Research, the Indian Government and WHO was held at the Institute of Ophthalmology and Gandhi Eye Hospital, Aligarh, India, from 11 to 30 November. The participants included 20 ophthalmologists from all 14 Indian States and 2 medical officers from Thailand and Burma respectively.

The purpose of the seminar was to help young ophthalmologists to gain further experience in the clinical and laboratory diagnosis of trachoma and to study the ways in which the infection spreads. Field demonstrations gave the participants practical experience of methods of field investigation and control measures.

The problem of trachoma has been under study at the Aligarh Institute of Ophthalmology for more than a year under the joint auspices of the Government of India and WHO. The aim of this research project is to determine the minimum effective course of treatment for trachoma and other factors on which a mass control programme could be based.

#### Antimalaria Co-ordination Board and Malaria Symposium

The inter-country Antimalaria Co-ordination Board, which first met in Saigon in November 1956, held its second meeting in Bangkok from 11 to 13 December. The meeting was attended by representatives of the malaria services of Burma, Cambodia, Laos, Thailand and Viet Nam as well as observers from the United States International Co-operation Administration missions in these countries. The World Health Organization, which convened the meeting, was represented by the Chief of the Malaria Section and the Regional Malaria Advisers for South East Asia and for the Western Pacific.

The agenda of the meeting included a review of the progress of the malaria programmes in each of the five countries, their



# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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#### Consultant neurologist for India

A neuropsychiatrist — Dr Edward Zysno of Germany — has been sent to India by WHO for a period of two years to assist the All India Institute of Mental Health Bangalore in its clinical organizational and teaching activities. One of Dr Zysno's principal tasks will be to continue the electroencephalographic work initiated at the Institute by a previous WHO consultant. Dr Zysno has had wide experience of neuropsychiatric work in various hospitals in Germany.

#### Food hygiene expert visits Egypt

Professor Aage Jepsen of the Royal Veterinary and Agricultural College in Copenhagen visited Egypt in December on behalf of WHO to give a series of lectures and demonstrations on food hygiene and veterinary public health at a post graduate course for physicians and veterinarians. The course was held at the High Institute of Health Alexandria. An expert in food hygiene particularly with respect to meat and milk. Professor Jepsen has served FAO and WHO as a consultant on several occasions and acted as a discussion leader at the recent seminar on veterinary public health held in Warsaw by the WHO Regional Office for Europe.

#### New appointment at WHO Regional Office for South East Asia

Dr A Zahra of Malta will go to New Delhi in the spring of 1958 to take up the post of Adviser in Communicable Diseases to the WHO Regional Office for South East Asia. Dr Zahra has been in the medical service of the Nigerian Government for the past few years and was the medical officer responsible for the successful WHO assisted yaws eradication campaign in the Eastern Region of Nigeria.<sup>1</sup>

#### Assistant Director of PASB resigns

The resignation has been announced of Dr Carlos Luis González, Assistant Director of the Pan American Sanitary Bureau (WHO Regional Office for the Americas). Dr González who has been elected Senator for the State of Tachira, Republic of Venezuela, will leave his present post at the end of March in order to take up his legislative duties.

A former Director of Public Health for Venezuela, Dr González joined the staff of the Pan American Sanitary Bureau in 1953 and has been Assistant Director of the Bureau since 1954.

# THE WORK OF WHO IN THE FIELD OF TUBERCULOSIS

## Objectives and organization

Even though some of the problems of tuberculosis control such as tuberculosis in migrants, refugees and seafarers are really international in character the main task is still the control of tuberculosis within each country. The aim of WHO in the field of tuberculosis is therefore to assist governments to make the maximum impact on the tuberculosis problem in their respective countries.

The assistance given may be divided into two main categories: direct and indirect. The former is the responsibility of the appropriate regional office while the latter is provided by WHO through its Headquarters.

### *Direct assistance to governments*

This may take a variety of forms which can be grouped conveniently under the following general headings:

*General advice on tuberculosis control.* This is often given by correspondence or in discussions between government officials and the officers of the regional office. In some cases a WHO consultant may visit the country for a short period; in others a WHO officer is especially assigned to a country for a longer period to give advice on the general control programme or on certain aspects of it.

*Projects for teaching, training and demonstration.* Up to now a large part of the direct assistance provided by WHO has come within this category. The projects have consisted partly in establishing so-called tuberculosis centres and partly in organizing mass BCG vaccination campaigns. For such projects WHO makes available specially trained personnel and often a limited quantity of

supplies and equipment. The WHO personnel take an active part in the daily routine work on the projects but are concerned only with demonstrating how the work should be planned and executed and with teaching and training national personnel.

*Fellowships and teaching and training courses.* In all its work WHO places great emphasis on the training of the personnel who are to occupy key positions in its programmes. If the appropriate training cannot be obtained within the country, fellowships may be granted to suitably qualified people to enable them either to visit one or more countries to see similar work actually in progress or to attend special courses. WHO also takes an active part in organizing national teaching and training courses—in addition to those connected with the WHO-assisted projects—and may provide assistance in the form of instructors and teachers especially if the government agrees to a considerable number of foreign students attending a course.

### *Indirect assistance to governments*

It is perhaps difficult to appreciate the value to governments of much of the indirect assistance given by WHO but a few examples may help to make this clearer.

Mainly through its Tuberculosis Research Office WHO has made and is still making considerable efforts to find a solution to the problem of how one single intradermal test might be used to determine with a high degree of reliability whether or not an individual has been infected with tubercle bacilli and to what degree a group of individuals has been thus infected. This problem has still not been solved, but it has been found that the Mantoux test with 5 TU appears to provide the most reliable answer and this information has been of considerable

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PRINTED IN SWITZERLAND

field of tuberculosis from experts in any part of the world

Most of the members have extensive knowledge and experience of only one or a few of the many topics on which expert advice is needed. In view of the rapid development of new specialized branches of tuberculosis control such as chemotherapy and chemotherapy prophylaxis the problems submitted to the Panel will be grouped in future into several categories and the Panel divided into corresponding sub-groups. This does not exclude the possibility that a member of the Panel may be asked to cover more than one category.

### *Contacts with research institutions*

Where new knowledge is accumulating quickly it is important for WHO to keep in close contact with the research institutions concerned. Concerning the effect of anti-tuberculosis drugs for example contact is maintained with such institutions as the Medical Research Council of Great Britain, the United States Public Health Service, the United States Veterans Administration and Cornell University, New York. Similarly as regards BCG vaccination it is necessary to keep in touch with the International Children's Centre, Paris, the Rockefeller Institute, New York, and the Research Institute of the Japan Anti-Tuberculosis Association, Tokyo.

*Short term consultants* Short term consultants are frequently appointed by WHO for periods of a few days or a few weeks to provide expert assistance when decisions on technical policy have to be made. For example at a meeting of the WHO/UNICEF Joint Committee on Health Policy UNICEF assistance for the domiciliary treatment of tuberculosis was to be discussed. WHO was asked to make recommendations regarding the anti-tuberculosis drugs to be used for such treatment. In order to assist the Organization in reaching a sound decision three experts from three different countries in Europe were appointed as short term consultants.

*Study groups* In addition to the expert committees which primarily advise WHO's governing bodies and report to the Executive Board, study groups may be appointed to advise the Director General on particular problems. These groups consist of a number of experts in the same speciality who meet and then report as a group.

### *Acquisition of new knowledge*

Lack of knowledge is the one big factor that hampers the formulation of a sound technical policy on which to base a programme for the control of tuberculosis. To remedy this situation WHO is taking an active part in promoting research.

There are several ways in which WHO can initiate a research project but the basic principle is that whenever possible the work should be carried out by other institutions or organizations with WHO's moral support and also if necessary financial or other direct assistance. Only when the formulation of technical policy is absolutely dependent on possession of certain information and no other competent institution can be persuaded to investigate the problem, is the research undertaken directly by WHO.

The role of WHO is to recommend projects for research and establish some sort of priority. The next step is to decide which of the following approaches can and should be adopted.

*Stimulation and co-ordination of research* In general an appeal from WHO to undertake research receives a very favourable response even if the problems to be investigated are outside the immediate field of interest of the person or institution concerned.

Another aspect of the co-ordination of research by WHO is that national feelings often make it difficult for research institutions to co-operate directly across national frontiers. In such cases WHO can provide a neutral and international meeting ground.

The role played by WHO in the stimulation and co-ordination of research can perhaps best be illustrated by two examples.

assistance to many governments not only in their BCG campaigns but also in other aspects of tuberculosis control work

Improvements have also been made in a number of other techniques used in tuberculosis control programmes for example the development of simple but reliable methods for detecting tubercle bacilli. In another direction the makers of X ray equipment are being urged to produce a simpler and therefore less expensive apparatus for chest examination suitable for use under existing conditions in the tropics

Most countries are trying to benefit from experience gained and progress made in other countries and it is one of the functions of WHO to facilitate this exchange of knowledge. The experience gained in one country will not be of full benefit to others however unless the results are reported in such a way that they are not only easy to understand but are also comparable with the results obtained in other countries. Some internationally accepted standards are therefore necessary. In December 1955 a study group convened by WHO met in Luxembourg to consider the problem and it was agreed that WHO should institute a programme of studies with a view to setting up standards to be adopted by countries engaged in tuberculosis control programmes. The working out of standard procedures for tuberculin testing of a population is already nearing completion and steps are now being taken to achieve standardization of the methods used for the screening of entire population groups for tuberculosis

### Formulation of WHO's technical policy

By WHO's technical policy is understood the general approach taken by WHO to a problem such as tuberculosis control as well as the methods and techniques recommended for dealing with this problem

Before any recommendations can be made a considerable amount of knowledge must be amassed about the basic problem and about any methods and techniques that have been used to deal with it in the past. A

careful scientific assessment must be made of the experience already gained

The second step is to evaluate the relative merits of the various possible methods and techniques that might be used. This may necessitate calling on the advice of experienced specialists before a final decision can be made

In discussing how the knowledge and advice are made available to the organization it is necessary to distinguish between two types of situation (1) where the necessary knowledge is already in existence and (2) where the necessary knowledge has to be acquired by instituting special programmes of research

### *Access to existing knowledge and experience*

With 88 Member States WHO has unique possibilities of access to knowledge and experience and also of obtaining expert advice on any matters pertaining to health

*Medical literature* Most of the existing knowledge relating to tuberculosis control wherever it was acquired will sooner or later be published in the medical literature. A good part of the recent medical literature is directly available in the WHO library in Geneva

*Conferences* WHO is invited to send official representatives to a large number of conferences and meetings at which matters relating to tuberculosis and tuberculosis control are discussed. One advantage of these meetings is that they frequently provide contacts with specialists from countries which medical officers from WHO Headquarters have little opportunity to visit. In addition to the immediate benefit of obtaining information concerning problems and experience in these countries such meetings often suggest where to go for useful advice in the future

*Expert Advisory Panel* The Expert Advisory Panel on Tuberculosis at present consists of 28 members from 24 countries. It provides the Organization with the machinery for obtaining existing technical information on any particular subject in the

contact on technical problems between the field personnel and the office in charge of the project including periodic visits by field personnel to the office and by office personnel to the field

This procedure has been adopted for the tuberculosis surveys at present being conducted by WHO in Africa. The field data are being collected by two tuberculosis survey teams—one for West Africa and one for East Africa—which administratively are under the WHO Regional Office for Africa. The record cards are then sent to the Tuberculosis Research Office in Copenhagen where the data are analysed and where finally the report will be written

#### Basic approach to tuberculosis control

It was stated 50 years ago and has often been repeated since that the correct approach to tuberculosis control is expressed in the sentence "Tuberculosis is a social disease with some medical aspects". On this basis tuberculosis control would consist mainly in improving social and economic conditions. There is of course a close connexion between the standard of living of a community and the magnitude of its tuberculosis problem. In practice however this approach implies that no direct control measure is effective and the description of tuberculosis as a social disease has often been used as the excuse for not taking any active steps to control tuberculosis

The correct approach WHO believes is a dynamic one based on the knowledge that tuberculosis is a communicable disease. From this it follows that if enough is known about the mechanisms which keep tuberculosis going in a population—the epidemiology of tuberculosis—and about the struggle for survival of the tubercle bacilli it should be possible to interfere with those mechanisms and the more intimate this

knowledge the better the chance of interfering at the right stage. Control measures must consist in establishing barriers to the natural course of events at points where they can be expected to produce the maximum effect at the minimum cost

Until about a decade ago tuberculosis control was mainly a clinical problem. Examinations for tuberculosis were usually made only when subjective symptoms of the disease were present. Diagnosis rested on the clinical art of the specially trained physician and treatment was dictated by the clinical judgment of the tuberculosis specialist without whom no tuberculosis control programme was conceivable. The scarcity of these specialists was one of the greatest limiting factors in tuberculosis control another being the expense of establishing and running the institutions necessary for effective treatment. The introduction of new methods of diagnosis and of preventive measures such as BCG vaccination and treatment with anti tuberculosis drugs has changed the situation radically

Today chest X ray films taken and read by trained technicians provide a more reliable indication of the presence of pulmonary disease than a physical examination by the best clinician and since demonstration of tubercle bacilli is considered the only sure basis for diagnosis the clinician's art is no longer relied upon for case finding

Photofluorography has provided a relatively inexpensive method of chest examination and the introduction of anti tuberculosis drugs has made it possible to treat infectious cases of pulmonary tuberculosis on a domiciliary basis with standard doses for a standard period without expensive institutions such as hospitals and sanatoria. Altogether the increased possibilities have created a demand from the community to be protected against tuberculosis

1 The need for simpler X ray equipment for chest examination in tropical countries has already been mentioned. For practical reasons the research necessary to develop such apparatus can be carried out effectively only by the companies producing chest X ray equipment. WHO has presented the problem in considerable detail to a number of the largest manufacturers and several of them have been visited by WHO representatives. In order to give interested companies the best facilities for studying the problem involved and for testing their own equipment under actual field conditions in the tropics X ray engineers from these companies have been engaged by WHO to work on some of its projects.

2 Evidence has been obtained from the results of a tuberculosis survey in Africa and from other WHO assisted projects that tubercle bacilli in tropical countries might not have the same characteristics as the types of tubercle bacilli well known in Europe and North America. Research on this problem was obviously required. WHO has succeeded in obtaining the co operation of five centres with special experience in tuberculosis bacteriology (four in Europe and one in the USA) in a co ordinated research project on the biological characteristics and geographical distribution of different types or groups of mycobacteria. WHO has undertaken responsibility for collecting material containing mycobacteria (mainly sputa) from different parts of the world and for sending it to the research centres.

WHO may make a token grant to some of the institutions engaged in such a research project to assist them in obtaining the necessary funds from their own authorities.

*WHO assisted research* Where more direct assistance is necessary to ensure the carrying out of a research project WHO usually makes a grant to the institution concerned. In general the institution also makes a material and financial contribution and it is only in exceptional cases that it is necessary for WHO to pay the total expenses.

An example of WHO assisted research is the investigation undertaken by the Medical

Research Council of Great Britain on the domiciliary chemotherapy of tuberculosis in Madras. The administrative arrangements for such a project are rather complicated and it is sufficient here to say that they are based on agreements between the Government of India and the WHO Regional Office for South East Asia and between the Medical Research Council of Great Britain and WHO. The Medical Research Council personnel working on the project are administratively WHO employees. The Council does not pay any of the expenses of the project in India and receives a grant from WHO to cover the expenses of the work which is carried out in London in connexion with the project.

*WHO conducted research* When it is decided that WHO should itself conduct research on tuberculosis this is done by the Tuberculosis Research Office. Almost all the problems that have been taken up by the Tuberculosis Research Office fall within the category of field research in public health. When complementary laboratory research is necessary the co operation of the Statens Seruminstitut in Copenhagen is obtained.

As far as field research is concerned there are two different patterns. Some problems can be studied exclusively in Denmark on the local population. The keeping qualities of BCG vaccine and of tuberculin dilutions and BCG vaccination of the newborn have been studied in this way. There are obvious advantages in having all the personnel engaged in the research directly under the control of the institution responsible for the project.

On the other hand many problems can only be studied on the basis of field data collected in the countries where they originate and where WHO's advice and assistance have been requested. The planning of the project and the evaluation of the data can however be done wherever is most convenient. For the success of such an operation it is important not only that the personnel making and recording the field examinations should be properly trained but also that there should be constant and direct

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proportion of uninfected persons and non specific reactors to tuberculin would be included in the vaccination programme—but it would also mean the inclusion of more infected persons

The most satisfactory solution would be to develop a more specific tuberculin test

It may be possible to fractionate tuberculin into components that are specific for infection with *Mycobacterium tuberculosis* and components that are responsible for the non specific reactions. At the present time various protein fractions are being studied in order to investigate this possibility

## TRAINING OF HEALTH PHYSICISTS

The development of nuclear reactors during the last 15 years has led to the creation of a new industry which is bringing radio active hazards on a scale previously unknown. Not only is the number of persons at risk increasing but the levels of radiation involved are extremely high. The gamma flux of a reactor operating even at a relatively low level is equivalent to that from several tons of radium.

The peculiar properties of ionizing radiations and the elusive nature of the dangers of exposure have created a demand for a new kind of highly trained specialist—the health physicist—to co-operate with medical men such as an expert is particularly well qualified to supervise practical measures of radiation protection and to work in conjunction with biologically trained scientists in studying the effect of radiation on life. As Dr Elda E. Anderson of the Oak Ridge National Laboratory Tennessee, USA, stated recently

Radiation is silent, unseen, unfelt; its presence made known only by instruments; its damaging effects on the human system frequently developing many years after exposure. Thus matters of radiation safety involve technical considerations requiring specialized and experienced scientists. Hence the need for personnel trained in health physics. Dr Anderson was speaking at the second international training course for health physicists organized by the WHO Regional Office for Europe in collaboration with the Belgian Government at the Centre d'Etudes Nucleaires at Mol, Belgium, from 30 September to 31 October 1957. The course which was directed by Dr Anderson was concerned

not only with the special techniques that the health physicist must acquire but also with the fundamental principles of radiation protection. It was attended by physicists, engineers, chemists and physicians from 18 countries of Europe and the Eastern Mediterranean Region. Dr Anderson was assisted by Mr Myron F. Fair and Dr L. C. Emerson, both of Oak Ridge. Lectures were also given by Dr W. Claus of the United States Atomic Energy Commission, Dr B. A. J. Lister of the Atomic Energy Research Establishment, Harwell, England, and Dr Per Grande of the Radium Hospital, Oslo, as well as by members of the staff of the Centre d'Etudes Nucleaires.<sup>2</sup> Some of the essential qualifications of the health physicist discussed by Dr Anderson in her address at the closing ceremony are summarized below.

### Requirements for the health physicist

If the health physicist is to understand the radiation hazard associated with routine reactor operation and with potential reactor accidents, he must have a fundamental knowledge of such questions as the sources of energy in the reactor, the distribution of this energy, the characteristics of the fission products and reactor instrumentation and control. Furthermore in order to understand the basis for the maximum permissible external doses and the maximum permissible

<sup>2</sup> A. Iran, B. Spain, B. Iceland, Egypt, France, Federal Republic of Germany, Greece, Iran, Iraq, Italy, Lebanon, Netherlands, Poland, Portugal, Switzerland, Turkey, Union of Soviet Socialist Republics and Yugoslavia.

<sup>3</sup> D. Boulenger, M. Dorch, Dr F. ex, M. Goens, M. Jongh, M. Maron, I. Schonen and M. J. open.

## RESULTS OF BCG VACCINATION IN INDIA

In 1954 WHO and UNICEF undertook to assess the results obtained in the BCG mass vaccination campaign in progress in India. Ideally the assessment would have determined the extent to which the vaccinations had prevented tuberculosis but this would have required that some groups be left unvaccinated to serve as controls—a procedure hardly feasible in a mass campaign. The task was therefore limited to an appraisal of the immediate effects of BCG vaccination measured in terms of the degree of post vaccination tuberculin allergy acquired and in evaluation of the techniques adopted in the campaign.

The assessment work was undertaken by the WHO/UNICEF South East Asia Regional BCG Assessment Team and was carried out under the technical direction of the WHO Tuberculosis Research Office (TRO) and in co-operation with the Indian Council of Medical Research. The results of the first nine months of assessment work were published in a preliminary report in the *WHO Bulletin*.<sup>1</sup>

The assessment team returned to India in February 1955 to corroborate the preliminary findings and to study certain aspects of the problems raised. This work was described in a second report in the *WHO Bulletin*. The 1955 assessment revealed that the vaccinations had produced a higher and more uniform level of allergy among school children than seemed indicated in the preliminary assessment and that the variations in allergy (with some very low levels) observed in 1954 appeared to have been due more to deficiencies in the tuberculin test than defects of vaccine or vaccination techniques.

The Mantoux tuberculin test was used on both occasions but in the second investigation some modifications were introduced to diminish variations in the potency of the tuberculin dilutions—a factor which has a marked

influence on the outcome of the test. Investigations made by the TRO had shown that the potency of tuberculin dilutions may vary considerably from one bottle to another and that the potency in a partially filled bottle tends to be lower than that in a completely filled bottle. To overcome this difficulty the 1955 team used four bottles of tuberculin in rotation on each testing day and only two thirds of the contents of each bottle. These procedures considerably reduced variations in the results but further studies on the stability of the tuberculin test are still in progress as an accurate tuberculin test is indispensable for a valid assessment of the results of BCG vaccination.

Another problem studied was the occurrence of natural non specific sensitivity to tuberculin in the general population. The studies made in 1955 in Mysore and Madras like those made in 1954 in neighbouring Travancore Cochin indicate that in South India an intradermal injection of 5 TU is not a reliable test for distinguishing persons who have been infected with tuberculosis from those who have not. The large number of natural non specific reactors (persons with intermediate size reactions to a standard low dose of tuberculin but presumably uninfected with tuberculosis) invalidates the 5 TU test and probably all tuberculin tests in current use. This widespread non specific sensitivity is not peculiar to India—it is found in many other tropical countries such as Burma, the Philippines, Indonesia, Mauritius, Nigeria, East Pakistan, the Sudan and Viet Nam. This inadequacy of the tuberculin test is a serious handicap in tuberculosis control programmes both from the diagnostic and from the epidemiological points of view and presents a practical problem of great importance in mass vaccination programmes.

A partial solution of the problem would be to raise the limit of a "positive" reaction to the 5 TU test. The adoption of this provisional solution would mean that a larger

organizations concerned with atomic energy. The World Health Organization is in fact, anxious to continue to co-operate as it has done in the past with such international organizations as the United Nations, UNESCO, FAO and ILO which are also occupied in their own particular fields with the applications of atomic energy. Again as recently emphasized, WHO is ready and willing to co-operate with the new International Atomic Energy Agency which has just been established in Vienna under the auspices of the United Nations. Indeed, WHO believes that it is only by respecting

the terms of reference of each organization that it will be possible to assure the maximum benefit for all the peoples of the world without neglecting the interests of future generations. With regard to its own role, WHO is convinced that by reason of its Constitution, the composition of its directing organs and its secretariat as well as the traditions it has maintained and the relations it has established, it is the organization which in the fascinating field of atomic energy is best qualified to continue to deal with all matters relating to the protection of health and the medical uses of radiation."

## LEPROSY CONTROL IN THAILAND \*

During the last few years, a new approach to the treatment of leprosy has been made in Thailand. The narrow view previously taken called for rigorous isolation of all patients in leprosaria. An attempt has been made to get away from this principle and to treat leprosy not as a disease apart but as a general public health problem along the lines recommended in the first report of the Expert Committee on Leprosy.<sup>1</sup>

The primary aim of this public health approach is to lower the incidence of leprosy by mass operations carried out by staff working within the general framework of the health administration of the country and conforming to generally accepted control principles. Any measures which will raise the standards of health of the population such as improvements in nutrition, sanitation and housing are likely to help in the control of leprosy. On the other hand, because of certain peculiarities—mode of transmission, long incubation period, difficulty of case finding, comparatively long treatment, need of follow up of treated patients, rehabilitation, etc.—leprosy poses problems of its own and many of the public health measures used in the control of other diseases are inapplicable.

In modern leprosy control programmes carried out with the assistance of WHO, these difficulties are overcome by proceeding in easy stages and by dividing up the areas where leprosy is endemic into small sections so that the results can be more readily controlled and evaluated. The following are the main steps recommended for what the Expert Committee called "mass control measures in limited areas":

- (1) selection of suitable personnel with genuine sympathy for and devotion to their patients followed by a programme of training;
- (2) a carefully planned survey of the areas where the control measures are to be instituted;
- (3) a concentrated attack on leprosy in the selected areas with mass chemotherapy of registered leprosy patients.

It was with this type of strategy in mind that a basic agreement was signed in 1949 between the Thai Government, WHO and UNICEF. The first step was taken in 1953 with the appointment of Or L. Dharmendra as short term consultant to Thailand, to make a survey of the leprosy conditions of the country and the pilot project area. On the basis of his report, it was possible to define the objectives of the project and to

concentration of radio active compounds in the body the health physicist must be informed about the biological effects of ionizing radiations and the factors on which these effects depend. The primary aim of radiation protection is and must be to avoid radiation injury without impeding the useful applications of atomic energy and its valuable by products the radio active isotopes. Consequently the health physicist must not only be familiar with the principles and techniques of protection but also learn to put the problem into its proper perspective in relation to science industry and society.

### Permissible levels of radiation

Even the smallest amount of radiation probably has some effect on living human tissue although at low dosages the damage is not detectable. The risk of undetectable damage cannot therefore be eliminated entirely but the aim must be to reduce it to a minimum by keeping the level of radiation as low as practicable. This is the purpose of radiation monitoring the routine measurement of the level of radiation to which the personnel engaged in a particular operation are exposed.

For the health physicist to make effective use of monitoring however he must also know what are the maximum permissible levels of radiation. As more and more people are becoming liable to exposure either occupationally or otherwise to higher levels of radiation it is important to establish maximum permissible levels for the population as a whole. Although precise numerical data on the effects of natural background radiations on world populations are still lacking some recent research suggests that the levels previously allowed may have been too high. Animal experiments indicate that the life span is shortened by large doses of radiation and there is presumptive evidence that smaller doses may have a similar if less pronounced effect. Moreover the accumulated effects of chronic exposure appear to be greater than was thought in the past and it is believed that some of the increase in leukaemia may be due to increased

exposure to radiation. For these reasons a maximum permissible accumulated dose has now been suggested which corresponds to a maximum permissible dose rate one third that previously allowed. Maximum permissible levels of exposure for persons living in the vicinity of nuclear plants and for the population as a whole have also been proposed.

### Training programmes

If mankind is to have the benefits of nuclear energy without radiation damage to the worker and the public it is clear that an adequate supply of personnel well trained in the principles and techniques of radiation protection will be essential. The decision to take an active part in promoting international co operation in this field was taken by WHO in 1954 and in November of the following year the first international training course for health physicists was held at the Karolinska Hospital in Stockholm also under the direction of Dr E E Anderson. It was the success of this course and the urgent need for trained personnel—again stressed at the Ninth World Health Assembly in May 1956—that encouraged the holding of further courses. The European Office of WHO has also awarded fellowships to public health medical officers to attend a course on radiation protection at Saclay France this year and arranged for a regional course on the public health aspects of radiation protection to be held in co operation with the Atomic Energy Research Establishment Harwell England at Oxford from 6 to 17 January 1958. At the closing ceremony of the second health physics course Dr P Dorolle Deputy Director General of the World Health Organization outlined the main features of WHO's atomic energy programme of which the training courses form only a part. This programme may seem a modest one he stated. In drawing it up however two considerations had to be borne in mind not to make too great a call on the limited number of experts in this field and not to encroach upon the terms of reference of the numerous other



prepare a plan of operations taking into account the rural domiciliary approach necessitated by the new policy of treating leprosy as a general public health problem.

The area selected for the pilot project was Khon Kaen Province in north eastern Thailand and with the assistance of WHO and UNICEF the plan was put into action by the Thailand Department of Public Health in November 1955. The salient features of the project were early detection of cases, dispensary and domiciliary treatment, follow up of cases and contacts, routine bacteriological examinations, health education and research in collaboration with the existing leprosy institutions. With the experience gained in this project it was intended to develop a nation wide programme to bring leprosy under control in all areas where it represents a public health problem.

By July 1957 when the project had been in operation nearly two years the following results had been achieved:

1. A complete survey of the whole population of Khon Kaen Province had been carried out with detection of nearly all cases of leprosy in the area. The survey included systematic examination of all school children followed by examination of home contacts of cases found and house to house canvassing as far as possible. Against an original estimate of possibly 1000 cases a register of 5000 patients was prepared representing an attack rate of 1% for the area.

2. All registered patients had been treated either in out patient clinics or at home. Treatment was given only twice a month by oral administration or by intramuscular injection. In the majority of cases treatment could be given with sufficient regularity and adequate follow up was possible. On the basis of clinical and bacteriological examinations the initial results were judged to be satisfactory and it can therefore be assumed that by reducing the sources of infection good protection has been offered to the population exposed to contact.

3. The success of the pilot project has demonstrated that the public health approach to leprosy control is effective and technically

feasible for Thailand. The 25 members of the project staff—1 national medical officer, 1 WHO expert leprologist, 3 sanitarians and 20 lay health workers—were found adequate to cover a population of about 600 000 and to deal with some 5000 cases of leprosy and their contacts.

The project also showed that in addition to the adoption of a technically sound control method three factors are of importance for the success of any campaign:

- (1) availability of funds
- (2) the right type of personnel
- (3) co operation from the public including local authorities and leprosy patients

In Thailand the government budget is adequate for salaries and supplies; the national staff has generally proved to be efficient and the patients themselves are co operative. It has therefore been possible to proceed with plans for a nation wide programme based on the results of the pilot project.

The new plan prepared by the Thailand Department of Public Health with the assistance of WHO and UNICEF is due to come into operation in 1958 and will be extended step by step to cover all areas in Thailand where leprosy constitutes a public health problem. It is estimated that it will take 10 years to complete this process. The programme has been conceived in three stages which will be applied successively to each of the limited areas as they are brought into the scheme.

- (1) the operational phase
- (2) the phase of consolidation
- (3) the phase of maintenance or integration

In the operational phase a concentrated attack will be made on the area by a specialized team along the lines of the pilot project already carried out in Khon Kaen. It is expected that the first two phases will last four years. In the second phase there will be partial integration into the existing public health services but a partial retention of the specialized staff. Finally in the third phase

## CHOLERA IN 1957

About 60 000 cases of cholera were officially notified in 1957 as compared with 66 000 in 1956. With the exception of six suspected cases in Cambodia and ten cases in Burma all cases have occurred in India and in East Pakistan. This information is contained in a note on the world cholera situation which appears in a recent issue of the *WHO Weekly Epidemiological Record* (No 3 1958).

The map on page 41 shows the incidence of cholera by district in India and East Pakistan in 1957. West Bengal and East Pakistan accounted for one quarter of the reported cases. Bihar and Uttar Pradesh also for one quarter while the remaining cases were reported in the central and south eastern parts of India.

## PLAGUE IN 1957

According to information contained in the *WHO Weekly Epidemiological Record* (No 4 1958) only 514 cases of plague were officially notified throughout the world in 1957 as compared with 670 in 1956 and 1228 in 1955. The 1957 figure is the lowest for any year since the beginning of the century. This is accounted for by the unusually small number of cases in India (44). As shown on the map on page 42 the other principal foci of the disease in 1957 were Burma (198 cases), Ecuador (72 cases), Madagascar (57 cases), the Belgian Congo (35 cases) and Peru (31 cases).

## RECENT NEWS OF THE 1957 INFLUENZA PANDEMIC

The influenza pandemic seems to be on the decline. This conclusion is drawn from reports reaching WHO since November 1957. Among information received recently are some figures from Japan which already had a severe influenza epidemic last summer. A second milder epidemic occurred in November particularly in those areas that had been lightly affected by the earlier outbreak. During the first epidemic the attack rate varied widely in different parts of Japan ranging from 0 / to 93 / . The total deaths attributed to influenza—excluding those from pneumonia or bronchitis—were as follows:

Month	Deaths	Month	Deaths
May	34	September	124
June	518	October	149
July	793	November	307
August	297		

Provisional figures

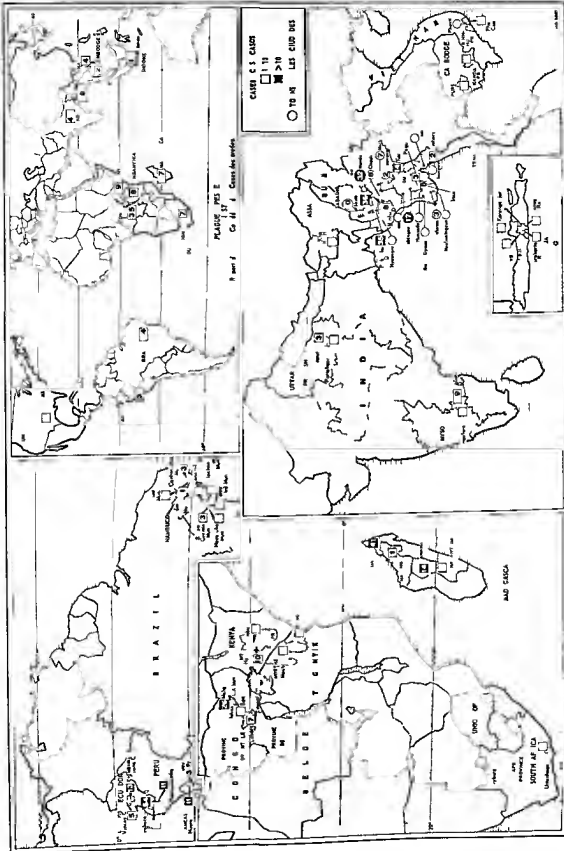
### Antibody response

A lack of specificity in antibody response after infection with the 1957 Asian strain has been noted by many specialists and the following note appeared in the *Communicable Disease Center Influenza Surveillance Report* No 27:

"It has been known for many years that antibody increases measured by complement fixation test with viral antigens from allantoic fluids are not specific for strain or sub-group within the broad immunologic type. It is not surprising therefore to learn that recent complement fixation tests using antigen prepared with A/Denver/1/57, A/Spirup/48, A/PR8/34 and other older Type A strains are often positive in the presence of Asian strain infection. Similarly antibody increases measured with the A/Asian/57 CF antigen would not necessarily be due to infection with an Asian strain."



# PLAGUE IN 1957



# Reports of Expert Groups

## MEASUREMENT OF LEVELS OF HEALTH

Since the raising of living standards to the maximum possible level is among the principal aims of the international organizations concerned with economic and social matters it is desirable that these standards should be accurately determined. Living conditions however are at present so different throughout the world that it is difficult to set a single standard for all countries or even for all the inhabitants of one and the same country.

Nevertheless there is no doubt that each social group has a level of living which is affected for better or for worse by changes in economic and social conditions. Bearing this fact in mind various international organizations decided in 1949 to assess the needs of economically under-developed countries with a view to better planning of programmes of assistance to these countries and subsequent evaluation of the results. They recommended that a clear and internationally acceptable definition of the concept of standards of living should be established and that adequate methods for the measurement of these standards should be found.

In 1952 the United Nations Economic and Social Council asked the Secretary General to convene an Expert Committee on International Definition and Measurement of Standards and Levels of Living. This Committee which met in New York in 1953 included representatives of the United Nations, ILO, UNESCO, FAO and WHO.

As it is impossible to establish an index of living for international application the Committee suggested that an analysis be made of various representative and generally accepted components and various statistical indicators for these components. It recommended that the following twelve components

should be taken into account: health including demographic conditions, food and nutrition, education including literacy and skills, conditions of work, employment situation, aggregate consumption and savings, transportation, housing including household facilities, clothing, recreation and entertainment, social security and human freedoms. Health heads the list as being a fundamental factor in levels of living and as being more or less closely related to the other components.

The World Health Organization was asked to study the components relating to health and the corresponding indicators. Since its foundation WHO has been endeavouring to improve methods of assessing community health in continuation of the work on health indicators already carried out by the Health Organization of the League of Nations.

In February 1955 Sir Andrew Davidson was invited by the Organization to undertake a preliminary study of the problem. This study served as a basis of discussion for the Study Group on Measurement of Levels of Health which met in Geneva in October 1955. The report of this group is summarized below.<sup>1</sup>

### Sources of data on levels of health

The measurement of the level of health of a community is one of the most formidable problems confronting the health administrator and his task would be immensely facilitated if he had at his disposal a set of reliable health indicators. Up to the present he has had to rely on analysis of vital statistics, epidemiological information, data collected from health surveys and special methods

<sup>1</sup> United Nations (1954) Report on the international definition and measurement of standards and levels of living. New York (E/CN.3.179 E/CN.3.179).

WHO Study Group on the Measurement of Levels of Health (1955) Report (Wld Hlth Orgn R Ser N 137).  
In press. Price 1/9 40/30. Swt 1. Also published in French and Spanish.

The hemagglutination inhibition test appears to be somewhat more specific. However even with it antibody increase can occasionally be detected using strains which were prevalent some time ago but are not responsible for the present infection. The observation has been made repeatedly that patients from whom Asian isolates have been obtained may produce antibody more readily detected with an A/Denver/57 or some older strain than with an Asian strain. This phenomenon is very similar to that described several years ago and epitomized by Davenport and Hennessy as the Doctrine of Original Antigenic Sin.<sup>1</sup>

These two authors were able to show in fact that the dominant antigens of the strains of influenza virus responsible for primary infections in childhood exert a persistent orienting effect on the production of antibody throughout the life of the individual. Monovalent influenza virus vaccines were given to persons in three different age groups. It was found that irrespective of the strain of virus used children born after 1943 responded with a rise in the titre of A prime antibody young recruits with a rise in type A antibody and persons over 30 years of age with an increase in antibodies to strains of swine influenza. This antibody response to heterotypic viruses appears to reflect the original exposure of the individual to certain types of virus rather than serological cross reactivity to several different types. By making use of this phenomenon it should be possible to characterize each age group of the population by a serological index which could be employed as an aid to the epidemiological study of the different variants of the influenza virus.

logical study of the different variants of the influenza virus

#### Type of virus responsible for the 1957 epidemics

According to recent information the Influenza Center at Montgomery Alabama USA has identified 232 strains of influenza virus received from 53 laboratories during the past few months. Only 4 of these were type B the remainder were all closely related to the strain A/Asian/Japan/305/57. It is thus evident that older strains were not responsible for the majority of the epidemics occurring in 1957. The report of the centre stresses the fact that used alone neither the complement fixation test nor the haemagglutination inhibition test enables a virus to be identified with certainty. When only the HI test was used as many as 40% of known Asian strain infections went undetected. By combining the two tests a much greater degree of sensitivity and specificity is possible but absolute proof of the identity of the strain depends on isolation of the virus.

\* \* \*

During the last few months the network of WHO influenza centres has again been expanded and the addition of two new laboratories in Moscow USSR and Warsaw Poland has recently been announced. These centres continue to collect and transmit information concerning the progress of the epidemics and their virological and immunological aspects.

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as a percentage of total deaths) was suggested by S. Swaroop and K. Uemura<sup>4</sup>. It is clear that if all persons survived up to 50 then the index would be 100 if no one reached that age the index would be zero. This method lends itself to international comparison: the necessary data are also easy to collect and it provides an effective instrument for the study of levels and tendencies. The Group drew attention to the possibility that "the percentage of deaths under five years to total deaths may well express the toll of communicable diseases" and recommended that studies on this indicator should be continued.

*Expectation of life* at the age of one year can also serve as a comprehensive indicator: the infant mortality below twelve months being included among the specific indicators. In view of the fact that expectation of life is determined in relation to census periods which are generally spaced at ten year intervals it is particularly suitable for comparisons covering long periods of time.

The *crude death rate* is based on the total number of deaths registered annually per 1000 inhabitants. Although this is not a very sensitive indicator in many countries birth and death registers may be the only available sources of data.

The category of *specific indicators* includes (a) *infant mortality*, (b) *deaths from communicable diseases per 100 000 inhabitants*, (c) *data concerning health services and activities*.

The *infant mortality rate* has always been considered as an important indicator of the level of health. Deaths among infants of 11 months may be affected by social and environmental conditions but to reflect this a refinement of statistics is needed which is rare in the less developed countries. For general use deaths under one year per 1000 live births should still be considered as a useful indicator.

With regard to *deaths from communicable diseases* a high death rate usually reflects a low level of living. For purposes of comparison

some all infective and parasitic diseases listed in Section I of the Detailed International Lists of Diseases, Injuries and Causes of Death or under the corresponding headings in the Intermediate or Abridged Lists should be used or if this is not feasible the diseases listed for the total mortality figure should be specified.

With respect to *data concerning health services and activities* it would be useful to have information regarding the number and geographical distribution of physicians and other health personnel, their level of training and qualifications and the extent to which their services are used. It must be recognized however that numerical data on physicians and hospital beds are not always an exact indication of the real health service facilities available in a given zone which can best be assessed by means of sample surveys. This type of information on health services and activities is also unsuitable as an indicator of the results of mass campaigns by mobile teams such as those conducted in certain African territories.

### Possible new indicators

The provision of *protected water supplies* and of *proper facilities for disposal of excreta* might be useful indicators for assessing *environmental conditions* provided that the extent to which the facilities are actually used is also ascertained. Special studies would also make it possible to determine the influence of ethnological factors.

Knowledge concerning the measurement of *mental health, nutrition and health aspects of housing* has not yet reached a stage where the Group felt able to suggest indicators suitable for world wide application. In this connexion and also with respect to the *social factors* which influence health the Group suggested that the international organizations, the national services and the research institutes should undertake surveys of family living conditions and that sociologists and ethnologists should study the various social structures and systems particularly in the under-developed regions.

for the evaluation of health activities<sup>3</sup> but he has been without any satisfactory indicators of all three aspects of health laid down in the WHO Constitution that is physical mental and social well being

As a rule investigations into the health of a community are based on the study of mortality rates expectation of life and incidence of communicable diseases whose variations are considered as an indication of progress or of retrogression as the case may be It has been argued that a drop in the mortality rate and an increase in the expectation of life do not necessarily reflect an improvement in the general level of health Nevertheless there is usually a positive correlation between the level of health and length of life

Reliable mortality figures have the merit of enabling comparisons to be made between one period and another and between one country and another thus providing useful indications of the changes which have taken place in community health and the factors affecting it

In this connexion it is interesting to note variations in infant mortality rates but it should not be forgotten that in many countries the considerable drop in deaths in the early age groups has not brought with it any parallel improvement in the health of the community as a whole and that the aim is not only to add years to life but also to improve health during those years

Statistics relating to notifiable diseases have also been used for the evaluation of health levels Such statistics do not lend themselves to international comparison however as they vary too much in their reliability

To be fairly comprehensive a list of morbidity statistics would include records of sickness among persons covered by social security schemes adult incapacity social survey of sickness of all forms hospital in patient and out patient records general practitioner studies and the more routine surveys of population groups (school children recruits etc) Analysis of morbidity

statistics makes it possible to ascertain the nature and extent of diseases and to study variations in prevalence which may throw light on the etiology and predisposing factors This is one of the reasons why WHO and the National Vital and Health Statistics Committees are endeavouring to standardize methods of ascertaining morbidity in order to make possible the international comparison of levels of health Up to the present assessment of health has consisted in the measurement of disease but specialized surveys like those made in connexion with nutrition and housing are a more direct approach to the problem of finding positive indicators for the measurement of health

### Various types of health indicators

The Study Group classified health indicators in three categories according to whether they refer to (a) the level of individual or collective health in an area (vital statistics nutrition etc) (b) physical environmental conditions in the area concerned (c) health services and activities for the improvement of health conditions (availability and use of hospitals physicians and other health personnel) An alternative way of classifying these health indicators would be according to the type of study employed micro analytical (study of the individual) or macro analytical (study of families communities or whole countries) Irrespective of the unit studied and the method employed *comprehensive indicators* might be established for the various aspects or groups of aspects of the problem and *specific indicators* for particular aspects of the problem or for a single factor

In the absence of sufficient information on which to base particular *comprehensive indicators* the group did not make any categorical recommendations in this respect although it emphasized the practical value of the following (a) *proportional mortality ratio* (b) *expectation of life* (c) *crude death rate*

*The proportional mortality ratio (number of deaths among persons of 50 years and over*

involve a certain risk to public health if the properties of the drugs are not adequately examined

By the publication of volumes I and II of the first edition of the International Pharmacopoeia, WHO has provided specifications to be used in the examination of a large number of pharmaceutical preparations. A new step was taken recently when WHO convened a Study Group on the Use of Specifications for Pharmaceutical Preparations the report of which has just appeared.<sup>1</sup>

In opening the meeting of this Group the Director General of WHO stressed that it was the first time that a study group had been convened to deal with the methods used for the examination of pharmaceutical preparations in different countries and to study principles which could be of help to national health departments.

World wide interest has been aroused by this problem as shown by the information reviewed by the Group. Thus as early as 1945 the Pan American Sanitary Organization undertook the study of ways and means of improving food drug and cosmetic control services in the Americas. The registration of pharmaceutical preparations in the different countries of the Americas was also discussed in 1955 at the General Assembly of the Pan American Medical Federation. Under the auspices of the International Pharmaceutical Federation a meeting of directors of laboratories for the control of medicaments has taken place every year since 1947 at which views are exchanged on assay methods used to examine pharmaceutical preparations as well as on procedures and administrative arrangements. The Pharmaceutical Products Sub-Committee of the Western European Union which has met regularly for some years has submitted reports aimed at standardizing the methods of determination of certain characteristics (melting point limits of impurities) recommended in different countries and at obtaining greater uniformity in the classification of poisons etc. The Pharmaceutical Union

of the Arab League also discussed the examination of pharmaceutical preparations in 1955.

WHO has already made a contribution to solving this problem by publishing the first International Pharmacopoeia the two volumes of which include specifications for more than 400 pharmaceutical preparations in international commerce. The Organization has thus given practical assistance to countries without a national pharmacopoeia, as well as to other countries in the preparation of their national specifications. Further more lists of proposed international non proprietary names for important pharmaceutical preparations are also published from time to time and are of considerable help in preventing the confusion caused by a multiplicity of common names for the same preparation. It was agreed that the Group would examine what further contribution would be most useful in these fields with the collaboration of national international and commercial institutions.

#### The examination of pharmaceutical preparations—aims and methods

The purpose of the measures suggested is to protect the consumer and provide for the examination of new preparations as they are placed on the market. It is important that sufficient information should be obtained as quickly as possible.

The examination of pharmaceutical preparations calls for a detailed and precise knowledge of many thousands of products. Consequently it is almost impossible for any one organization to be familiar with all the problems involved. At present, a large number of the national pharmacopoeias are inadequate for reference purposes and in many cases the inclusion of all substances of therapeutic interest in the current edition is impossible since the preparation and revision of such books require much time and the collaboration of many groups of scientists. Thus it may happen that specifications for the examination of a substance do not appear in an official book (pharmacopoeia codex national formulary) until use of the prepara-

<sup>1</sup> WHO'S Study Group on the Use of Specifications for Pharmaceutical Preparations (1957) Report (WHO Tech. Rep. Ser. No. 13) 79. Price 1/9 \$0.30 S. f. 1. Also published in French and Spanish.

## Surveys of representative population groups

The Group recommended the carrying out of special sample surveys to obtain detailed information on which new and more satisfactory indicators could be based. In the under developed areas such surveys could provide vital and health statistics which would constitute a basis for registration systems. This is a method to be recommended because it is not costly and the data collected can be rapidly analysed. Moreover data obtained direct from a representative population group are nearly always more reliable than those taken from a general register.

In accordance with the report of the Expert Committee on International Definition and Measurement of Standards and Levels of Living already referred to above two types of sample survey were proposed i.e. the multi purpose and the special purpose survey. The former would cover the various aspects of individual or community living (nutrition consumer goods employment education transport social security etc) and would provide a great deal of interesting information on health. This method is particularly suitable for multi phase investigations in a single area. The first phase would consist in a general survey of family living conditions. On the basis of the information obtained it would be possible by applying the principles of probability to select suitable fractions of the original first phase sample for the collection of more detailed and technical information which could then be used to select a third phase sample and so on. The data on purely health factors may be classified in two large groups depending upon whether they relate to *total prevalence* or to *incidence*

*of new cases*. Information on prevalence can be obtained by general census methods whereas incidence data must be reported at the time of occurrence if they are to be accurate.

In a *prevalence* study the following factors must be determined: population of the zone to be surveyed; proportion of the population sick at a given moment; number of houses and proportion with adequate water supply and excreta disposal facilities.

To obtain data on *incidence* it is necessary to compile a history of happenings previous to the survey or else to carry out repeated surveys in the same community. A third method is to collect information on previous sickness experience in each age group preferably using objective tests indicating exposure to certain diseases (for example the tuberculin or Schick test) and serological examination (such as sero protection against yellow fever and the Wassermann test). In interpreting such tests due attention must be paid of course to any immunity induced by vaccination. A variant of this method is to obtain a history of past infections according to age and through study of the cumulative number of cases in the different age groups to arrive at a picture of the morbidity and severity of a particular communicable disease in the population group under study.

Annex 2 of the report of the Study Group on the Measurement of Levels of Health gives three sources of information on health statistics and morbidity surveys: WHO periodical publications containing mortality and morbidity data; other WHO publications and documents on morbidity statistics; and lastly various publications on national morbidity sample surveys.

## USE OF SPECIFICATIONS FOR PHARMACEUTICAL PREPARATIONS

### Present position

During recent years scores of new medicinal substances have been introduced annually into the materia medica whereas twenty years ago the number was relatively small

and five to ten years might elapse between the development of a new drug and its general use. The marketing of new medicinal substances which often find favour with the public as soon as they are available may

specifications for pharmaceutical specialties but in some countries responsibility has been delegated to professional groups such as national pharmaceutical associations. The government administration may have the laboratory tests and other work carried out in government laboratories in university departments or in other scientific institutes. It is advisable for the administrator to be solely responsible for the work done and for the responsibilities of any organization of this nature to be clearly defined. In a small country savings in personnel and equipment may be effected by installing the administration and laboratory services in one centre. In larger countries it will usually be more convenient and less time-consuming if regional laboratories are established in the large urban centres. It is often advisable to obtain the views of outside consultants or possibly of special commissions comprising professors of pharmacy, pharmacology and medicine as well as members of the scientific and technical staff of firms manufacturing pharmaceutical or chemical products.

#### *Scientific services*

In the past specifications for pharmaceuticals have been based largely on physical and chemical tests such as melting point, specific rotation and qualitative reactions. In recent years new tests have been introduced however and new techniques developed for the identification of chemical substances and estimation of their purity e.g. X-ray diffraction determination of crystallographic characteristics, infra red absorption spectra, the use of ion exchange resins, counter-current extraction, chromatographic separation etc. Use of these techniques calls for specialized personnel.

#### *Staff of a control laboratory*

The head of the service in the chemistry and physical chemistry department should be a specialist in pharmaceutical chemistry and be well versed in the many fields of analytical chemistry. He should be familiar with current physico-chemical methods and have a

good understanding of pharmacology and physiology.

The analyst should be an adequately trained chemist or pharmacist, proficient in the analysis of preparations for which methods are given in the pharmacopoeia or other official books. After a period of training he will learn under the direction of the head of the service how to work out methods for separating constituents and to choose the best assay technique. Analysts should be selected not only for their basic knowledge but also for their ability to handle instruments and apparatus.

Laboratory technicians may also be employed working under the supervision of the analyst and can relieve him of certain routine operations such as distillations, extractions etc.

#### *Fellowships*

It is advisable for fellows to make a definite choice of the branch which they wish to study for it is difficult for the same person to acquire in a limited time technical training in the control both of pharmaceuticals and of food. Fellows who intend to carry out laboratory techniques should spend several months in the institute which they are visiting and be given an opportunity to take part in the everyday routine work. Fellows mainly interested in administration and organization could limit their visits to a much shorter period.

#### *Control of pharmaceutical preparations at the time of manufacture*

In most countries the number of preparations sold is so large that the control laboratory cannot examine them all within any reasonable period of time. It is impossible for any country to have sufficient staff to examine every batch of every preparation sold. A few figures will make the extent of the problem clear. In Canada for example there are about 26 000 pharmaceutical preparations on the market. If only two batches of each of these are manufactured annually this calls for 52 000 analyses every year. Some



tion is already on the wane. It is true that much information may be found in scientific publications but the literature is so voluminous and in so many languages that it is almost impossible for those responsible for the control of pharmaceutical preparations to keep abreast of everything that is being published.

### Possible future role of WHO

In view of this position the Group considered a suggestion for the establishment within WHO of a service responsible for obtaining examining collating and distributing reference data on new pharmaceutical preparations. To be of the greatest value such information would have to be made available rapidly. The Group therefore felt it advisable to secure the collaboration of the pharmaceutical industry either directly or through the members of the Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations and other specialists or through pharmacopoeia commissions health administrations and other authorities as in the case of non proprietary names. On the basis of the information collected WHO would compile information sheets. These would be distributed to Member States and to members of the Expert Advisory Panel as well as to other specialists and to control laboratories. The information sheets would give details concerning the chemical formula and molecular weight physical properties (melting point boiling point refractive index optical rotation etc.) solubility identification assay methods for the pure substance and for pharmaceutical preparations manufactured from it purity tests stability storage of the substance and of its pharmaceutical preparations pharmacology and relevant literature references.

The terms of reference of the Group also included the study of problems connected with the introduction of new pharmaceutical preparations of therapeutic interest and in addition to this question consideration was given to the various aspects of the organization of a national control authority.

### Principles to be followed in introducing a pharmaceutical preparation

The Group examined the general principles on which the introduction of a pharmaceutical preparation should be based and found that the relevant regulations differed widely from one country to another. After reviewing the requirements in force in various countries the Group was of the opinion that the following data might be of value to the authorities responsible for public health.

(a) the qualitative and quantitative composition declared in the commonly accepted nomenclature

(b) details of analytical methods and possibly certain useful indications on the method of preparation

(c) physico chemical constants if not already known

(d) the therapeutic indications and dosage

(e) the recommended method of selling (prescription etc.)

(f) samples in sufficient quantity for analysis

(g) information concerning label package and publicity (advertising)

If a speciality contains substances or combinations of substances the action of which is not generally known additional information may be required such as

(h) publications or documents regarding the pharmacological action of the substance and its toxicity clinical reports on its therapeutic efficacy and side effects.

The Group felt that study of the legislation in force in different countries should be continued and that subsequent meetings should consider how this legislation could be simplified and made more uniform in order to reduce obstacles to international commerce while still fully protecting public health.

### Organization of a national control authority

#### Administration

In most countries the government itself assumes responsibility for the application of



of them very complicated. This is clearly beyond the capacity of an official control laboratory. Thus an important step which can be taken by the authorities dealing with the examination of pharmaceutical preparations is to arrange for the inspection of pharmaceutical manufacturing plants with a view to ensuring that they exercise proper control

at all stages of manufacture beginning with the raw materials and proceeding through the production stage to the final pharmaceutical form. Control of the labelling is also very important. When a manufacturer does not have a suitable control system it may be necessary in some countries to give detailed advice on how to set one up.

## SAFETY OF FOOD ADDITIVES

Among the many public health problems of direct concern to everyone few have been more neglected than the safety of food additives.<sup>1</sup> A wide variety of additives are in use today on a large scale as preservatives, antiseptics, flavouring, colouring and emulsifying agents etc. In countries with a high standard of living the use of such substances makes it possible to satisfy the demand for highly attractive foods and a wide choice at all seasons including foods imported from distant producing areas. In less developed countries many of which have tropical or sub-tropical climates but lack modern storage facilities food additives can be of great value in preventing wastage of seasonal surpluses. From the economic point of view therefore food additives serve an extremely useful purpose but they have their dangers. Not only can they be used by an unscrupulous manufacturer to mask deficiencies in the quality of his product but they may sometimes prove toxic to the consumer or reduce the nutritional value of the food to which they are added.

For these reasons there is an urgent need for effective control to be exercised over the use of food additives. In some countries legislation has already been introduced but the problem is obviously one requiring international action particularly in view of the large and ever increasing volume of international trade in foods treated with additives.

### Some general principles

At the suggestion of the Joint FAO/WHO Expert Committee on Nutrition a conference was held in 1955 to see what contribution FAO and WHO could make to the solution of this problem. The conference recommended the setting up of a Joint FAO/WHO Expert Committee on Food Additives to formulate general principles governing the use and control of the substances in question.

The first report<sup>2</sup> of this Committee contained a list of the purposes for which the use of food additives might be considered justified. Before the use of a new food additive is authorized clear evidence should be available that it will be of benefit to the consumer and that there is no foreseeable risk of harmful effects. The Committee emphasized the importance of estimating the probable rate of consumption when assessing the danger of toxic effects and the need to exclude the presence of harmful impurities by establishing specifications of purity defining the substance in chemical and physical terms. Certain administrative measures were outlined which were considered suitable for ensuring the effective control of treated foodstuffs.

At a meeting of the Joint FAO/WHO Expert Committee on Food Additives in June 1957 toxicological procedures were considered in detail. A report has been prepared which is intended to give a general picture of the type of data that should be

<sup>1</sup> A report by the Joint FAO/WHO Expert Committee on Nutrition, 1955, which added to the list of food additives the following: anti-oxidants, emulsifiers, and preservatives. See *World Health Organization Reports* 1955: 97.

*World Health Organization Reports* 1956: 107  
*World Health Organization Reports* 1957: 129

Functional tests and macroscopic examination of organs do not always reveal pathological effects but may indicate the need for more detailed study. Histological studies on the other hand are very time-consuming and should be kept to a minimum though they may provide the earliest evidence of toxicity. The Committee particularly stressed the importance of following up any evidence suggestive of a carcinogenic action and considered that this question should be given further study at a later date by a group including specialists in cancer research.

### *Interpretation of results*

As in all animal experimentation great caution must be observed in interpreting the results and deciding their applicability to man. By spreading the tests over several different species it is possible to extrapolate the result to man provided that a sufficient safety margin is allowed. It should be

assumed that all the foods likely to be treated with the additive will contain it at the proposed level and on this basis a standard daily dietary dose can be calculated, i.e. the amount of the additive that would be consumed by an average adult eating a normal diet. The committee believed that an arbitrary factor of 100 applied to the experimentally determined maximum "in effective" dose would constitute an adequate margin of safety. Special consideration might have to be given to substances of very low toxicity.

The Committee recommended that FAO and WHO should give every possible encouragement to the continuation and expansion of research into better methods of assessing the safety of food additives. It proposed that the Committee should meet for the purpose of drawing up specifications for the more important food additives and the possibility of exchanging unpublished information on investigations relating to the use of food additives should be explored.

## *Health Legislation*

### MEDICAL SPECIALIZATION A COMPARATIVE STUDY

Although many studies on post graduate medical education have been published they contain very little information about standards for specialist training and requirements for the recognition of specialists in different countries. An extensive survey undertaken by the World Medical Association in 1949 revealed that not many countries had standards for specialist training and that very few of them had embodied these standards in their national legislation.

Since the publication of this survey in 1950 about fifteen countries have enacted legislation on medical specialization or have recast or amended earlier laws on the subject.

This type of legislation is of considerable importance to the medical profession and

the recent publication in the *International Digest of Health Legislation* of a new comparative study<sup>1</sup> of national laws and regulations pertaining to medical specialization is particularly timely.

In general one of two systems is followed the regulation of medical specialization by law or the older more conservative system whereby the matter is left entirely in the hands of the professional associations and is not subject to legislation. The fact that a relatively large number of countries have enacted legislation on medical specialization in recent years would appear to indicate that the first system is gaining ground. The develop-

<sup>1</sup> See *I. D. H. L.* 19 7 8 6. This study is also available in pamphlet form (price 1/9 \$0.30 or 5/- f. 1).

microscopic examination of the tissues is carried out where necessary. Acute toxicity tests enable toxicities of related materials to be compared and may reveal species differences. They should provide sufficient information for the planning of further studies.

### *Short term (sub acute) toxicity studies*

In short term studies the material under examination is mixed uniformly with the animals food and administered over a period up to 10% of the normal life span. A series of experiments is carried out at various dosage levels including at least one that has no effect and one that produces definite toxic effects. Both rodents and non rodents should be used and equal numbers of males and females. Rodents should be taken shortly after weaning to enable the effect on growth to be studied. Any changes in the general appearance and behaviour of the animals should also be noted. In some cases food intake estimations and biochemical studies may be required. Macroscopic and microscopic examination of the organs should be undertaken the most important organs for detailed study being in many cases the liver and kidney. Such studies may reveal a possible cumulative action the nature of the pathological changes and the approximate dosage level at which these effects occur. They may also provide a guide to a suitable dosage for long term tests and indicate a need for more extensive investigations. On the other hand it may be obvious that the substance is too toxic to warrant further study.

### *Long term (chronic) toxicity studies*

These studies are usually conducted in rats and continued for the major portion of the life span i.e. for about two years. To avoid confusion between pathological effects and the normal effects of ageing however it is often desirable to terminate the experiments after 12-18 months. On the other hand for special purposes total life span studies extending over two generations may be necessary. In general the

substance is administered with the diet as in the case of short term studies but when testing for a carcinogenic effect parental administration may be advantageous. About 25 rats of each sex are used at each dosage level larger numbers may be needed if it is desired to sacrifice some animals for pathological examination during the experiment. Any adverse effects on reproduction lactation or the offspring should be noted in addition to the observations described under short term studies. A statistically significant difference in weight gain between test and control animals may not be a toxic effect. Anorexia or lack of palatability of the food may be the explanation. Food intake should therefore be checked and paired feeding experiments instituted if necessary. If there are no appreciable differences in food intake the possibility of impaired absorption or utilization of the food should be examined. Changes in the nutritional value of the food may also have to be considered. Toxic effects may become apparent in these long term studies which could not be predicted from experiments of shorter duration. The results will indicate the maximum dosage level at which no detectable ill effects occur when continued for the major portion of the animal's life span.

### *Biochemical and other special investigations*

In addition to the studies outlined above it may be profitable to examine certain aspects of the metabolism of the substance under test such as the route and rate of absorption and excretion tissue storage and the nature of the metabolites. Such studies must be done at high dosage levels in the first instance to enable the metabolites to be isolated. Later they should be repeated at levels nearer to those likely to be encountered in practice. Chromatography and radio active tracer techniques have proved helpful in separating small quantities of metabolites from complex mixtures. Sometimes a minor metabolite proves to be more toxic than the original substance. Other biochemical studies such as possible interference with enzymatic processes can also be of value.

### Sensitivity reactions to penicillin

In order to obtain information on the incidence and nature of untoward reactions to penicillin administration a questionnaire was sent by WHO to members of the WHO Advisory Panel on Venereal Diseases and Treponematoses. Thirty replies were received relating to experience in venereal disease clinics in the Americas, the Eastern Mediterranean, Europe and South East Asia. Figures from 25 centres indicate that at least 2 347 000 persons were treated in the clinics concerned during the period 1952-56. During those years the rates of sensitivity reactions have varied from 0% to 5%, and while there is some suggestion that the incidence is increasing the evidence is far from conclusive. There was a majority of opinion that reactions were less common in children than in adults and that they were more frequent after repeated injections.

Among 626 551 cases treated in clinics in 17 countries there were 9 deaths representing 1 death per 69 600 persons or 0.014 per 1000.

A fuller analysis of the replies received will shortly be published in the *Bulletin of the World Health Organization* in a note by R. R. Wilcox.

A detailed study of penicillin reactions in respect of a particular area has also been made. Between October 1951 and May 1955 106 such reactions were recorded in Taiwan. 74 of them anaphylactic and 32 urticarial. Of the anaphylactic reactions 12 were fatal, 19 were severe and 43 were moderate. This study by O. Idsöe and Wang Ping Nan will also be published in the WHO *Bulletin*.

The authors point out that the consumption of penicillin is very heavy in Taiwan which can be considered a potentially penicillin sensitized country. The great majority of the anaphylactic cases for which information is available are known to have received penicillin before the injection which caused the reaction, and only one of those who died (a 7 month-old boy) is known not

to have had the drug before. All those in the urticarial group for whom there is information reacted within 24 hours of receiving penicillin. The authors conclude that since this is too short a time for the production of antibodies the persons concerned were already sensitized by previous penicillin treatment.

### Effect of intradermal tuberculin tests on BCG-induced allergy

It is generally accepted that as time goes on there is a spontaneous waning of the allergy produced by BCG vaccination. Certain reports suggest however that the annual application of the tuberculin test to school children (10 TU administered intradermally) prevents this decline of allergy. Because of the absence of data based on a systematic study of the subject trials with school children have now been undertaken to determine whether the administration of tuberculin does in fact have this "boosting" effect.

In connexion with these studies K. Magnus of the WHO Tuberculosis Research Office (TRO) has carried out tests on guinea pigs—the waning of the BCG induced allergy being more rapid in these animals than in man.

The purpose of this author's first experiment was to ascertain whether the waning of the vaccination induced allergy once begun could be stopped by the intradermal administration of one or several doses of tuberculin and if so what doses of tuberculin should be administered. The results obtained confirm that in the guinea pig the decline of the allergy can be prevented by intradermal injection of tuberculin. No statistically significant difference was demonstrated between the effects of the two doses of tuberculin used—5 TU and 100 TU of purified tuberculin. It was noted moreover that animals given four injections had lower levels of allergy than those given only one. This

ment of medicine in the last fifty years has been marked by a continuous increase in the number of specialists and the number of specialities and it is therefore understandable that there should be this growing tendency to enact legislation protecting the public against unqualified practitioners or defending the interests of physicians with special medical training. In this connexion it may be noted that whereas there were only about ten recognized medical specialities at the beginning of the century today there are at least fifty. In fact in some countries half—or more than half—of the physicians are specialists.

From the study published in the *International Digest of Health Legislation* it may be seen that the training and recognition of specialists (whether or not as a result of an examination) are the responsibility of the Ministry of National Education, the Ministry of Health, the universities or the medical associations to which the State delegates certain powers. Specialist training must normally be undergone in duly recognized establishments or institutions or under the guidance of approved supervisors of studies. A specific period of training is normally laid down for each speciality although it varies from country to country (for example for paediatrics the period of training may be from 2 to 5 years, for surgery from 3 to 6 years and for ophthalmology from 2 to 4 years). In some countries—for example Austria and Denmark—the over all period of training is stated in general terms whereas the periods of training to be undergone in the principal, secondary and complementary branches are specifically prescribed. At the beginning of the century most medical specialists spent several years gaining experience in general practice before devoting themselves

exclusively to their chosen speciality. Today however general medical experience is no longer required in some countries before specialist training which begins immediately after graduation. Only partial credit towards the prescribed period of training is given for training acquired abroad.

Recognition may be granted as a result of an examination before a State board of examiners or a group of physicians appointed by the medical association or it may be granted on the presentation of documents attesting the nature and period of training undergone.

Although laws on medical specialization do not normally stipulate that specialized professional attention be given exclusively by a specialist they nevertheless contain provisions designed to protect specialist status. The use of more than one specialist designation is moreover strictly controlled. From an examination of the pertinent legislation it appears that a certain number of specialities may be practised concurrently, those which may be associated in this way differ from country to country but in some countries ophthalmology may be practised together with otorhinolaryngology, surgery with neurology and radiology with radiotherapy.

Many other aspects of medical specialization are dealt with in the study, the subject matter of which is arranged under the following headings: introduction, laws and regulations, definitions of specialist specialities and period of training, training requirements, qualifying examinations, certification boards, concurrent practice of specialities, protection of title, refusal of certification or recognition and appeal procedure, registration of specialists, transitional provisions, conclusion, references.

## Notes and News

### Sensitivity reactions to penicillin

In order to obtain information on the incidence and nature of untoward reactions to penicillin administration a questionnaire was sent by WHO to members of the WHO Advisory Panel on Venereal Diseases and Treponematoses. Thirty replies were received relating to experience in venereal disease clinics in the Americas, the Eastern Mediterranean, Europe and South East Asia. Figures from 25 centres indicate that at least 2 342 000 persons were treated in the clinics concerned during the period 1952-56. During those years the rates of sensitivity reactions have varied from 0% to 5% and while there is some suggestion that the incidence is increasing the evidence is far from conclusive. There was a majority of opinion that reactions were less common in children than in adults and that they were more frequent after repeated injections.

Among 6 6551 cases treated in clinics in 17 countries there were 9 deaths representing 1 death per 69 600 persons or 0.014 per 1000.

A fuller analysis of the replies received will shortly be published in the *Bulletin of the World Health Organisation* in a note by R. R. Willcox.

A detailed study of penicillin reactions in respect of a particular area has also been made. Between October 1951 and May 1955 106 such reactions were recorded in Taiwan. 74 of them anaphylactic and 32 urticarial of the anaphylactic reactions 12 were fatal, 19 were severe and 43 were moderate. This study by O. Idsoe and Wang Pin-Nan will also be published in the *WHO Bulletin*.

The authors point out that the consumption of penicillin is very heavy in Taiwan which can be considered a potentially penicillin sensitized country. The great majority of the anaphylactic cases for which information is available are known to have received penicillin before the injection which caused the reaction and only one of those who died (a 7 month old boy) is known not

to have had the drug before. All those in the urticarial group for whom there is information reacted within 24 hours of receiving penicillin. The authors conclude that since this is too short a time for the production of antibodies the persons concerned were already sensitized by previous penicillin treatment.

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suggests that side by side with the boosting effect repeated tuberculin tests following vaccination may also cause desensitization

In his second experiment Magnus attempted to obtain information on the duration of the allergy increasing effect of the tuberculin test and to determine whether the same increase in allergy can be obtained with another type of tuberculin and with smaller doses than those employed in the first experiment

He found that allergy boosted by an intradermal injection of 5 or 100 units of purified tuberculin will slowly wane but is still slightly enhanced after 8 weeks. No boosting effect was observed with the weakest dose of purified tuberculin 1 TU. Various dilutions of Old Tuberculin also have an enhancing effect

These experiments have proved that in the guinea pig the application of the tuberculin test can prevent waning of BCG induced allergy. It remains to be seen whether the same results can be obtained in man but this will only be known in three to four years when the studies at present in progress have been completed

A question which is important from both the theoretical and practical viewpoints and to which an answer has still to be found is: are the tuberculin induced variations in levels of allergy accompanied by corresponding variations in immunity?

#### Interpretation of tuberculin reactions

A recent number of the WHO *Bulletin*<sup>1</sup> contains a paper by J. Guld of the WHO Tuberculosis Research Office (TRO) presenting findings which largely explain apparent fluctuations in the response of BCG vaccinated persons to tuberculin tests

In recent years conflicting results have been observed in tuberculin tests performed at the Central Tuberculosis Dispensary in Copenhagen. After giving a definite reaction in the routine annual tests held to detect cases of recent infection certain subjects no longer did so when retested a little later

The aim of the investigation reported in the above mentioned paper was to determine which of the two results—tuberculin positive or tuberculin negative—was the correct one and the causes of the apparent disparity

A thousand persons, some of them BCG vaccinated who were attending the Dispensary for the annual routine examination were subjected alternately in the order of their arrival to one or other of the following tuberculin test procedures: (a) intradermal injection in the forearm of 3 TU followed on the third day in the event of the local reaction being less than 13 mm in diameter by a second injection of 10 TU in the other forearm; (b) an injection of 5 TU followed by another also of 5 TU if the diameter of the local reaction was less than 15 mm on the third day after the first injection

An additional study was carried out to investigate the degree of agreement between the results of the tests when the size of the local reaction is measured by different persons

In a third study an attempt was made to determine whether the annual repetition of tuberculin tests in the same part of the body can affect the response

The findings in persons not vaccinated with BCG confirm the general view that tuberculous infection is followed by a uniform degree of tuberculin sensitivity. In practically every person infected with tuberculosis a test which is carefully carried out with a suitable dose gives a perceptible reaction. Consequently the term "tuberculin positive" can be used to designate persons not vaccinated with BCG who give a definite tuberculin reaction and this response may be considered as due to infection with tuberculosis

The above applies to Europe and other parts of the world where the sole source of natural sensitivity is infection with *Mycobacterium tuberculosis*. It is known that there are populations in South East Asia and other tropical regions which show a pronounced natural non specific sensitivity. Among such populations a marked reaction to a tuberculin test is not necessarily a proof of tuberculous infection for the intensity of

such non specific reactions makes it impossible to differentiate between them and genuinely positive tuberculin tests

In such populations the terms "tuberculin positive" and "tuberculin negative" are useless since wherever the borderline is traced between "positive" and "negative" and whatever the methods adopted for the tests the classification will still not correspond to a biological reality

In BCG vaccinated persons the allergy induced by the vaccine can vary quantitatively from person to person over a very wide range. Because of this the almost universal practice of setting up arbitrary limits between "positive" and "negative" reactions in BCG vaccinated persons may be a source of confusion and misinterpretation

There are several factors which explain why tuberculin tests given to the same person in the same way produce different results. They include inaccurate standardization of tuberculin instability of the dilutions injected and differences in estimating the size of the reaction. In addition it must be remembered that repeated intradermal injections in the same area of skin cause local sensitization (the author found a high percentage of accelerated reactions) and a general "booster" effect on allergy

The classification of BCG vaccinated persons as either "positive" or "negative" is unrealistic and has no practical significance. Owing to the existence of the factors mentioned above the BCG vaccinated person may be found tuberculin positive in one test and tuberculin negative in another so that there is a danger of arriving at a false conclusion. Thus in some cases it will be considered that the vaccine induced allergy has disappeared and in others that a person has become infected with tuberculosis when in fact the allergy has not altered

Expression of the results of vaccination as percentages of positive and of negative reactions with respect to a given tuberculin dose and on the basis of arbitrary limits—e.g. the size of the local reaction—will doubtless give some information on the degree of sensitivity reached in a group. However the data thus obtained are much

less precise than those based on the average size of the local reaction. Thus two groups of persons may both be 100% "positive" yet in one group the local reactions may be much larger than in the other (stronger sensitivity)

As BCG vaccination is at present being carried out on a large scale in many countries where extensive population groups have been vaccinated these peculiarities of the tuberculin reaction given by vaccinated persons must be borne in mind in evaluating the results of vaccination and variations in sensitivity in such groups

### Economic losses caused by echinococcosis

Echinococcosis both human and animal, has serious economic consequences in several European countries where it is prevalent. According to a study by Dr M. Suic in the WHO *Bulletin* echinococcosis is very wide spread in certain parts of Yugoslavia and causes enormous losses in the production of milk, meat and wool. The destruction of infested meat causes a loss of more than 2 000 000 kg every year furthermore animals suffering from the disease are thinner leading to a decrease in production of more than 12 000 000 kg. In addition infested cattle give less milk this loss is put at about 116 000 000 l annually. As regards wool production there is an annual loss of more than 110 000 kg. Animal echinococcosis costs Yugoslavia 7 000 000 000 dinars annually in this way or nearly \$23 000 000. Some idea of the harm done to the national economy by human echinococcosis is given by the cost of hospital treatment and the number of working days lost. The sum involved is 62 000 000 dinars—about \$200 000—per year.

Yugoslav research workers have therefore made an effort to collect relevant epidemiological data to serve as a guide in taking subsequent measures to eradicate the disease or at least prevent its spread.

## Recent developments in the insecticide-resistance problem

There is little doubt that insecticide resistance is on the increase. In fact as was pointed out in July 1956 by a WHO Expert Committee on Insecticides resistance is developing more rapidly than the necessary measures to deal with it. In view of this the Committee felt that an international co-operative programme of research on the problem was called for—a programme designed on the one hand to determine the extent of insecticide resistance throughout the world and on the other to find out more about the origin and mechanism of the various types of resistance. In November 1957 an Expert Committee on Insect Resistance and Vector Control was convened by WHO to review what had been accomplished by this co-operative programme during its sixteen months of operation. The data on which this committee's review was based have been summarized by A. W. A. Brown of the Division of Environmental Sanitation, WHO, in an article that is to appear in a forthcoming number of the *Bulletin of the World Health Organization*.

During the period in question three new resistant species were discovered (*Anopheles subpictus*, *Chrysomya putoria* and *Rhipicephalus sanguineus*) while eight species already resistant to one insecticide were observed to have extended their tolerance to others (2 to DDT, 4 to BHC and dieldrin and 2 to organo phosphorus compounds). Also the geographical area covered by resistant populations was found to have increased considerably in the case of 11 of the species examined.

It is not possible to mention here all that has been achieved on the research side.

—Notable advances have been made in the systematization of knowledge of the genetic origins of resistance. DDT resistance in the housefly in *Anopheles gambiae* and in *Aedes aegypti* has been shown to originate mainly from a single gene and to be associated with the ability to detoxify DDT by dehydrochlorination. Dieldrin resistance in *Anopheles gambiae* has also been shown to

derive from a single gene whose presence in a certain number of individuals has been demonstrated in field populations even before dieldrin spraying was begun.

—Normal susceptibility levels for a large number of mosquito species have been assessed so that in future workers will be able to detect resistance as soon as it appears.

—It has been demonstrated that selection pressure from organo phosphorus compounds in the laboratory will induce moderate resistance to them and high resistance to chlorinated hydrocarbon insecticides.

—The existence in mosquitos and bed bugs as well as in houseflies of two distinct types of resistance to chlorinated hydrocarbons—one to DDT and its analogues and the other to dieldrin and other cyclodiene derivatives extending to gamma BHC—has been confirmed.

—Some understanding of the physiological mechanism of BHC resistance in the housefly has been reached.

—And finally the interesting discovery has been made that there are certain chemical compounds which seem to be more toxic to resistant strains of houseflies than to normally susceptible ones. A DDT susceptible strain has been produced from a DDT resistant one by submitting the latter to selection pressure from an impure sample of a certain organo phosphorus compound for three generations. If the same can be done in the case of resistant strains of other insects of public health importance it may be possible to work out a practical means of counteracting insecticide resistance.

## A promising outlook for malaria eradication in Southern Rhodesia

With increasing efforts being devoted to the eradication of malaria and simultaneously with an ever growing number of reports being received that certain vector mosquitos are showing varying degrees of resistance to insecticides it is of no little interest to be reminded that positive results are nevertheless being achieved in very many countries. Dr William Alves, Director of

the Malaria and Bilharziasis Research Laboratory at Salisbury Southern Rhodesia, reports that a recent survey in that country shows that following seven years of insecticide spraying the malaria parasite rate among the indigenous population is now so low that for practical purposes a break in malaria transmission may have been achieved. Should this indeed prove to be so the continued use of chloroquine as a suppressive may no longer be justified and the large scale application of insecticides may now be unnecessary.

There remains however a dangerous potential source of infection in the immigrants from other territories seeking employment in Southern Rhodesia. Measures have therefore been taken at several points of entry to dose immigrants with tablets containing 150 mg of amodiaquine and 15 mg of primaquine.

A full account of Dr Alves's findings will appear in a forthcoming issue of the *Bulletin of the World Health Organization*.

It may be added that in response to a request from the Government WHO is sending to Southern Rhodesia a malariologist and an entomologist for a period of 18 months to review the situation and to make recommendations to the Government.

#### Meeting on malaria eradication

A meeting on malaria eradication was held in Baghdad under WHO auspices from 7 to 12 December. It was attended by malariologists from Cyprus, Egypt, Iran, Iraq, Jordan, Lebanon, Pakistan, Saudi Arabia, Somalia and Syria, as well as representatives from WHO Headquarters, Geneva, and the WHO Regional Office for the Eastern Mediterranean, Alexandria. Observers were present from UNICEF, UNRWA, the US International Cooperation Administration and the Rockefeller Foundation.

In the course of the meeting the progress of malaria eradication in the Eastern Mediterranean Region was reviewed and plans were made for the co-ordination of the future malaria eradication activities of the countries and territories represented. The standardiza-

tion of methods of operating and reporting in order to achieve maximum efficiency and comparability of results was also discussed. Papers by specialists in various aspects of malaria control and eradication were used as a basis for discussion. The recent development of DDT resistance in *A. stephensi* in Iran and Iraq was brought to the attention of the meeting and ways and means of solving this important problem were discussed.

#### Division of Malaria Eradication established at WHO Headquarters

On 1 December 1957 a Division of Malaria Eradication directed by Dr E. J. Pampana was established in the Department of Advisory Services at WHO Headquarters, Geneva. The functions of the new Division are to advise on malaria eradication policies and techniques and to direct and co-ordinate all the malaria activities of the Organization. The Division has a Planning Section and a Programme Section which includes a Malaria Intelligence Unit. Dr E. B. Weeks has been appointed Chief of the Programme Section.

The Planning Section will give advice and assistance on plans of operation, research work and pilot projects. It will also be responsible for the supervision of pre-eradication survey teams and special advisory and research teams.

The Programme Section will follow the progress of eradication programmes, provide technical guidance and advice on any difficulties that may arise. It will also deal with matters relating to the recruitment and training of staff for malaria eradication, and will act as the secretariat for the Expert Committee on Malaria. The Malaria Intelligence Unit will be concerned with the collection and circulation of technical information on malaria eradication including progress reports on eradication programmes throughout the world.

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presented a cheque for \$5 million to Dr M G Candau Director General of WHO as a voluntary contribution from the US Government to the WHO Special Account for Malaria Eradication. On the same occasion Mr Dulles presented a cheque for \$2 million to Dr Fred Soper Director of the Pan American Sanitary Bureau which acts as the WHO Regional Office for the Americas for the Special Malaria Fund of that region.

In presenting these cheques Mr Dulles said malaria has left a trail of personal tragedy adverse effects on industry agriculture education and economic progress. Our own nation has suffered acutely from this disease. Until recent years malaria cost the United States over \$500 million yearly

and unmeasurable human misery. Our country has now rid itself of this scourge but today more than 600 million people in the world are still exposed to this killing debilitating disease. Mr Dulles went on to express the agreement of the United States with WHO's goal of malaria eradication adding: "If the world does not immediately seize this opportunity [it] may well be lost. The campaign must be completed before the malaria carrying mosquito becomes resistant to modern insecticides."

The WHO Special Account for Malaria Eradication was set up in 1955 to receive voluntary contributions from governments and private sources for malaria research purposes and to provide equipment supplies and services for the eradication of the disease.

## Review of WHO Publications

### THERAPEUTIC AND DIAGNOSTIC SUBSTANCES

*Bulletin of the World Health Organization*  
1957 Volume 17 Numbers 4-5 (pages 517-864)

International collaboration on drugs and biological substances has its roots in the latter part of the nineteenth century since then an extremely complex network of activities has grown up. For the World Health Organization this has involved work in such varied spheres as to name but a few: the standardization of and the proposal of recommended requirements for biological substances; the establishment of an international pharmacopoeia; the proposal of internationally acceptable non-proprietary names for drugs; the collection and dissemination of information on the production and use of food additives; the development of internationally recommended laboratory methods; the establishment of requirements for the postal

transmission of virus preparations and other potentially dangerous substances; and the international control of addiction-producing drugs.

A number of papers illustrating several facets of this activity were published in 1954 in the *Bulletin of the World Health Organization* under the title *Therapeutic, Prophylactic and Diagnostic Substances*. The present issue brings together a new collection of such papers covering a somewhat narrower range of subjects.<sup>1</sup>

The first four papers are from the Department of Biological Standards, National Institute for Medical Research, London, which holds the International Standards for pharmacological substances. Two of these articles describe the newly established International Standards for Tetracycline and Erythromycin, defining the International Unit for each. The other two are concerned with assay methods

<sup>1</sup> For the text of the report see the advertisement on the end of the book.

In one a precise assay of diphtheria toxin is described based on the linear relationship between the logarithm of the toxin dose and the diameter of the skin response. It eliminates the need for preliminary titrations, is economical, provides information about the slope of the log-dose response lines and therefore of the validity of the assay and yields limits of error of potency from the internal evidence of the assay. In the other a new method is given for the assay of penicillin in blood serum using *Sarcina lutea* as the test organism; this method makes it possible for fiducial limits of the estimated potencies to be readily computed.

By a resolution adopted in 1953 at its sixteenth session the United Nations Economic and Social Council invited the World Health Organization to prepare information on the additive properties and therapeutic advantages of synthetic as compared with natural narcotics; the status of scientific knowledge on the relationship between the chemical structure of a drug and its addictive properties and the relationship between the strongly analgesic qualities of a drug and its addiction-producing properties. This invitation was made to WHO as one of the four organs concerned with the international control of addiction-producing drugs, the others being the Commission on Narcotic Drugs of the Economic and Social Council, the Permanent Central Opium Board and the Drug Supervisory Body. The Commission on Narcotic Drugs, a policy-making body composed of the representatives of fifteen governments, makes recommendations as to the means by which the control of narcotic drugs may be improved. The Permanent Central Opium Board is made up of eight experts appointed by the Economic and Social Council; the Board studies the statistics on the illicit narcotics traffic and suggests measures to be taken where governments fail to comply with international agreements. The Drug Supervisory Body reviews yearly each Member State's requirements in narcotic drugs; it is composed of four experts, two appointed by WHO, one by the Permanent Central Opium Board and one by the Commission on Narcotic Drugs. Finally

WHO acts in an advisory capacity—to the other international narcotics control organs as well as to governments—on the medical aspects of addiction and of addiction-producing drugs. In accordance with the resolution of the Economic and Social Council a series of studies has been prepared on synthetic substances with morphine-like effect. Three of these have been published in earlier numbers of the *Bulletin of the World Health Organization*. The fourth, dealing with clinical experience on potency, side-effects and addiction liability, makes up the bulk of the present issue.

## VIRUS DISEASES

*Bulletin of the World Health Organization*  
1957 Volume 17 Number 6 (pages 865-1056)

This issue of the *Bulletin*<sup>1</sup> comprises articles on two of the neurotropic virus diseases (poliomyelitis and rabies) which have lately been thrown into prominence—on the one hand by the urgent need to avert an increasing threat of communicable infection and on the other under the stimulus of innovations in treatment and prophylaxis. Before the Second World War the Health Organization of the League of Nations sponsored the collection of much information on these diseases, tracking and investigating outbreaks of poliomyelitis and putting forward proposals for the international control of rabies. It is only during the past decade, however, that fundamental large-scale research in particular on human immunization could be pursued with all the impetus of improved laboratory techniques and increased understanding of immunity mechanisms derived from work on other virus and bacterial diseases.

In 1950 and 1953 respectively the World Health Organization convened Expert Committees on Rabies and Poliomyelitis to examine the existing state of knowledge and

<sup>1</sup>For the list of contents see the advertising section at the end of this issue of the *Cronica*.



to define general programmes of research. Since then at several sessions recommendations have been made in both fields on methods of diagnosis, study of the virus and the production and application of vaccines, and sera. Members of the WHO Expert Advisory Panels on Rabies and Poliomyelitis together with other collaborating workers have proceeded on the basis of these recommendations and the results are reported in many of the papers in this number of the *Bulletin*. In addition two monographs have been published—one to provide guidance on acceptable and uniform laboratory techniques for use in rabies work, the other a reference book on the diagnosis and treatment of poliomyelitis. Two special numbers of the *Bulletin* have also appeared devoted respectively to recent developments in rabies research and prophylaxis and to a consideration of resemblances between virus meningo encephalitis and poliomyelitis. Successful control of these diseases must inevitably be based upon the laboratory and the contributions included in the present issue of the *Bulletin* show that much work of this nature is in progress.

Workers in the USA have contributed two experimental studies on antirabies immunization of man with HEP Flury Harris type and Semple type vaccines given in different dosages; these papers are complemented by a further report from an international team on antibody response to different schedules of serum and vaccine inoculations in non exposed persons. Another American worker using mice explores the interference phenomenon noted in human rabies prophylaxis. One paper from the Pasteur Institute of Southern India describes a method for the preparation of lyophilized rabies street virus material for challenge; another reports an experimental evaluation of serum vaccine and combined methods of rabies treatment in guinea pigs challenged with Indian street virus. The results of the compulsory mass canine vaccination cam-

paigns in Malaya are brought up to date in a brief note. Different methods of local treatment of wounds caused by rabid animals are discussed in a contribution from a Spanish laboratory.

The production of killed poliovirus vaccines demands a thorough understanding of the structure of the virus itself as well as of the kinetics of reaction between it and the chemical agent; this highly topical problem is considered in an article from Sweden dealing with the inactivation of poliovirus by formaldehyde. Two French workers present a comparative serological study of poliomyelitis and encephalomyelitis antibodies in certain population groups. A Canadian research team describes observations on the use of dialysed vaccine for tissue culture safety testing of Salk vaccines. Finally an account is given of the methods used in Israel to produce safe and effective polio vaccine on a semi industrial scale.

## MALARIA

WHO Malaria Conference for the Eastern Mediterranean and European Regions (1957) *Report (World Health Organization Technical Report Series No 132)* 47 pages

Price 3/6 \$0.60 Sw fr 2. Also published in French and Spanish

This report deals with the Malaria Conference for the Eastern Mediterranean and European Regions held in June 1956 in Athens. It includes an analysis of the problems encountered by the antimalaria services of the countries concerned as well as suggestions for technical, administrative and financial measures to hasten the eradication of the disease in the two Regions. A summary of the work of the Conference will be found in an earlier issue of the *Chronicle*.<sup>1</sup>

**CORRIGENDUM**

**Vol 11 No 10**

**MAN'S SPIRITUAL AND SCIENTIFIC LEGACY  
FROM ROSS**

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# THERAPEUTIC AND DIAGNOSTIC SUBSTANCES

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Rabies control in Malaya. August 1955–October 1956—*C. H. Wells*

Some observations on tissue culture safety testing of Salk poliomyelitis vaccines—*F. P. Nagel, R. E. Amstutz & R. C. Fench*

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## WORK OF THE ANAESTHESIOLOGY CENTRE IN COPENHAGEN

*In most countries anaesthesiology first began to emerge as a separate discipline about twenty years ago and this was soon followed by the establishment of the new specialty in 1950 the Danish Government and the University of Copenhagen equated the assistance of WHO in establishing an international centre in Denmark. This assistance was provided the form of first class and full scholarships for trainees from other countries by the Danish Government has taken over more and more of the responsibility for the centre and it is expected that within a few years will become a fully national project in the number of scholarships which experience has enabled the centre to have served a valuable purpose and 179 anaesthetists from 9 different countries have been trained in seven years with at least below Dr E. W. O. A. de Senneby Chief Anaesthetist Copenhagen County Hospital department of the work—a development of the discipline of the centre.*

It was in the years 1947-1949 that the new specialty of anaesthesiology began to gain official recognition in Denmark and the first full time hospital posts for anaesthetists were created in the university towns of Copenhagen and Aarhus. In the USA, Canada and the United Kingdom, rapid advances were being made particularly in the techniques of administering anaesthetics but in Denmark as in other European countries large quantities of anaesthetics were still being given by untrained surgeons, theatre sisters and nurse anaesthetists who were more or less self-trained. There was in fact an almost complete lack of trained anaesthetists in Denmark.

In this situation Dr J. Frandsen, Director General of the National Health Service of Denmark, decided to seek the assistance of WHO in setting up a centre to provide facilities for international training in anaesthesiology. Through Professor E. Husfeldt, surgical adviser to Dr Frandsen, the co-operation of the University of Copenhagen was also ensured and the centre was established at Copenhagen on 1 May 1950. With the assistance of WHO it was possible to recruit instructors of the highest international standing—mainly from the United

Kingdom and the USA—for the first year as course and WHO also provided fellowships for non-Danish trainees in addition to placing certain literature and equipment at the disposal of the centre.

### Anaesthesiology as a public health concern

It has been said that the main concern of WHO is with problems of public health and preventive medicine and that anaesthesiology does not properly belong in these categories. As Dr E. Kohn, Chief Exchange of Scientific Information Section, WHO has pointed out however: "If we bear in mind that properly conducted anaesthesia prevents many a complication in the operating room and in the post-operative period then the preventive aspect is rather obvious. One may say that there are very few diseases indeed that have the incidence of surgical operations and anaesthesiology thus becomes an effective means in the prevention of disease and death in situations that are often as inevitable as disease itself." On the other hand, improperly administered anaesthetics can



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spend about two months in each Danish trainee is attached to the same hospital for the whole year of the course as they are able to visit the other hospitals during their normal specialist training. Whenever possible the teaching programme is supplemented by instructive films by special demonstrations in one of the hospitals and by visits to laboratories hospitals not participating in the course and factories producing drugs oxygen or anaesthetics. Once a year the whole group of visiting trainees and Danish instructors pays a visit to a number of Danish provincial hospitals.

The practical teaching at the different hospitals is by no means uniform, of course. One hospital may be in favour of using cyclopropane in the majority of cases another may recommend nitrous-oxide-oxygen-curare-ether sequences while a third may place the main emphasis on local and regional anaesthesia. This has disadvantages for the beginner but it enables the more advanced trainee to gain a first hand knowledge of a variety of methods and form his own judgement as to their relative merits. It also underlines the fact that the same end may be achieved through different means and that good results depend more on sound technique than on choice of method.

On the theoretical side the course has so far offered about 120 lectures covering all aspects of anaesthesiology including related topics in the fields of surgery internal medicine neurology radiology and serology. Short courses in physiology pathology and pharmacology are also given subject to the availability of lecturers. From the beginning of the eighth course in February 1958 the theoretical instruction was intensified in order to bring the inexperienced trainee as quickly as possible to the stage where he can derive the maximum benefit from the course. Some of the hospitals offer additional theoretical and clinical training on a basic level to smaller groups.

Within the last seven years 39 visiting consultants have been selected from among the best anaesthetists in England, the USA and the Scandinavian countries. Practically every one of these consultants has had his

own special sphere of interest and although they may sometimes have held diametrically opposite views on certain points this has again helped to give the trainees a broad outlook. Some of these consultants have held informal tuition sessions which have been greatly appreciated.

The problem of language has not been, and probably cannot be completely solved. Instruction is given in English but it has proved almost impossible to find out in advance whether an applicant's knowledge of this language is adequate to enable him to follow the course. On the other hand it has happened that a trainee whose knowledge of English at first appeared to be quite insufficient afterwards turned out to be an excellent anaesthetist with the sort of enthusiasm for the new specialty that made him a pioneer when he returned to his own country. Another language difficulty is that the majority of trainees having no knowledge of Danish are unable to communicate with the patients.

### The results

During the period May 1950 to January 1958 the course has been attended by 179 trainees from 29 different countries. In 1955 a questionnaire was sent out to ascertain what had happened to the individual trainee and the present status of anaesthesiology in his country. Of the 90 trainees who attended the first four courses 50 are now heads of anaesthesia departments 12 are whole time anaesthetists and 7 more are part time anaesthetists. Seven of the remainder are taking advanced training in anaesthesiology or doing research abroad while 12 are no longer working as anaesthetists. The study is being pursued in greater detail.

It is interesting to examine the development that has taken place in Denmark itself since the centre was established. In 1949 there was only one chief anaesthetist in the

There were 91 from Denmark, 10 each from Austria and Norway and 7 each from Germany and Yugoslavia. Switzerland sent 6, Finland and Spain 5 each, and Greece, Italy, Portugal, Sweden, and Sweden each sent 4. The remainder 17 came from 13 other countries. The trainees attend 1 course each and 1 from the USSR and 1 from Poland.

cause death or disability Beecher & Todd have reviewed the position in the USA and conclude Anaesthesia might be likened to a disease which afflicts 8 000 000 persons in the United States each year More than twice as many citizens out of the total population of the country die from anaesthesia as die from poliomyelitis Deaths from anaesthesia are certainly a matter for public health concern

It should perhaps be pointed out here that the administration of anaesthetics during operations is only one of the functions of a modern anaesthetic service During the tragic epidemic of poliomyelitis in Denmark in 1952 new methods of treatment were developed simply by transferring the operating room techniques of the anaesthetist to the medical wards Following this experience the advice of the anaesthetist has been sought in many different branches of medicine and this has been largely instrumental in revising previous concepts regarding the treatment of tetanus certain cardiac and pulmonary diseases cerebrovascular accidents paediatric diseases and various types of injury Recently an entirely new approach has been made to the whole question of the transport and resuscitation of poisoned asphyxiated and severely injured patients In these ways too anaesthesiology is making its contribution to public health

### Functions of the Copenhagen training centre

It has never been the aim of the centre to offer a complete training in anaesthesiology Post graduate clinical training takes an absolute minimum of six years In Denmark for example the requirements are clinical practice for one year medicine (pharmacology or physiology) for one year surgery for one year and clinical anaesthesia for three years In other European countries the curriculum is similar The course at the Copenhagen centre lasts one year and it is therefore legitimate to ask what purpose it serves Is it intended to offer basic training for physicians having no previous knowledge of anaesthesiology moderately advanced

training for physicians already having some knowledge of the subject or advanced training in the most recent concepts of anaesthesiology for specialists? Looking back the most truthful reply seems to be that the centre has made some attempt to do all these things without doing any of them properly The main reason for this lies in the heterogeneous nature of the class at any one of these courses Not only are the trainees drawn from many different countries but they also differ widely in their previous experience in anaesthesiology Of those attending the seventh course for example two were expert anaesthetists two had never given an anaesthetic before and the rest had either trained themselves or received some kind of instruction

By force of circumstances therefore the courses have had to be designed with as wide a scope as possible in order that all the participants might benefit from them Those who have had no previous experience receive a basic training and are enabled to judge whether they wish to continue their specialization if so they may be given advice on how to plan their future training possibly with financial and moral support from WHO Trainees with previous knowledge of anaesthesiology have the opportunity of studying a number of different techniques in addition to supplementing their theoretical knowledge and they are able to profit from contact with some of the leading specialists in the field Those who are already specialists are given a chance to delve more deeply into certain problems and may be granted follow up fellowships by WHO for specialized training in other countries

### Organization and programme

Considerable emphasis is placed on the desirability of presenting to the trainees a variety of schools of thought This is achieved in two ways by inviting foreign consultants to be responsible for part of the instruction and by a system of rotation between hospitals for the practical training Six Copenhagen hospitals are co operating with the centre and visiting trainees usually

# PROGRESS IN MALARIA ERADICATION IN TAIWAN

The figures speak for themselves in 1951 there were about 1.2 million malaria cases in Taiwan in 1956 the number of confirmed cases was exactly 497. This result obtained after five years of intensive control indicates that malaria may well be completely eradicated in Taiwan within three to five years if nothing happens to change the epidemiological situation.

What are the reasons for this remarkable success? The question is not without importance for the many other countries engaged in malaria eradication. It is true that Taiwan has had the benefit of a particularly favourable combination of circumstances — for example its insular position and very dense population—but the achievement is none the less a very real one. The pages that follow give an account<sup>1</sup> of the methods—some of them new—which were employed in the Taiwan campaign and of the difficulties which had to be overcome or still remain.

## Control programme and eradication programme

When in 1951 the Taiwan Provincial Government decided to undertake malaria control throughout the island this decision was justified for several reasons: the country had a sufficient number of public health personnel; the results of operations carried out from 1946 to 1949 had been encouraging; the necessary insecticides could be largely made in the country itself and finally approaches to international and bilateral assistance organizations had brought offers of technical and material aid.

The aim of the initial project as defined in the agreement between the Chinese Government and WHO was to reduce the incidence of malaria in four years from 1952

to 1955 to such an extent that the disease would no longer represent a major public health problem. Towards the end of 1955 however the encouraging results led to the conversion of the malaria control programme into an eradication programme. Thus there was no break in continuity between the two programmes carried out jointly by the Taiwan Provincial Malaria Research Institute (TAMRI)—the successor of the Taiwan Malaria Institute set up in 1946 by the Rockefeller Foundation—and by WHO with the assistance of the International Co-operation Administration (ICA), the Council for United States Aid (CUSA) and the Joint Commission on Rural Reconstruction (JCRR).

Before we go on to consider the various features of the programme it may be helpful to give some background information concerning the country, the structure of its health services and the malaria situation in 1951.

## The setting of the campaign

The province of Taiwan which includes the large island of Taiwan (formerly known as Formosa) two thirds of which is mountainous and several small neighbouring islands has an area of 13 886 square miles. The climate which is tropical or sub tropical is characterized by an average annual temperature of 74 F and an average annual rainfall of 50-250 inches according to the region. The population (more than 9 000 000 in 1956) is concentrated in the western coastal plains at the foot of the western slopes of the central mountain chain and in some strips along the eastern coast. The western plains have a good road system.

Every large administrative division (five municipalities sixteen hsien and one special administrative district) has a health centre. The smallest administrative unit (the township or city district) is served by a health station. The island has in all 22 health

<sup>1</sup> See report on malaria control and eradication in Taiwan (1957) prepared by the Taiwan Provincial Malaria Research Institute (TAMRI) for the WHO Technical Committee on Malaria. A shortened version of the report appears in the Bulletin of the World Health Organization.

whole of Denmark now there are 34 and 28 of these have been trained at the centre. Ten of the 28 subsequently had additional training in the USA or Great Britain. In 1954 university chairs in anaesthesiology were established in Copenhagen and Aarhus. It is also worth mentioning that during the period 1950 to 1957 four of the Danish instructors were sent abroad as medical consultants by WHO. The scene has thus undergone a striking change since the centre was first opened and there can be no doubt that as far as Denmark is concerned the time lag that normally occurs before the importance of a new specialty is recognized has been greatly reduced. It is also known that there has been a steady increase in the number of departments of anaesthesia in many other countries and that post graduate training is being carried out by former trainees in Norway, Spain, Yugoslavia and Taiwan. It cannot be taken for granted however that these results have been due entirely to the influence of the centre.

#### Some criticisms

On the questionnaire sent out to trainees criticisms of the course were also invited. Some of the suggestions received have already been taken into account in the planning of subsequent courses. On the administrative side several trainees complained of the lack of homogeneity of the group taking the course, a difficulty already referred to. This in turn was reflected in the variety of criticisms made concerning technical aspects. Thus some trainees complained that there was no obstetrical anaesthesia, others that there was no paediatric anaesthesia. Again

some would have welcomed more attention to thoracic anaesthesia, others to regional anaesthesia, while some trainees complained of the neglect of such subjects as hypothermia, controlled hypotension and the use of an extracorporeal circulation. With a course of only 12 months' duration and the present method of selecting trainees mainly from countries entitled to receive technical assistance it is clearly impossible to meet all the widely differing requirements of the individual trainee. Consideration has therefore been given to the possibility of increasing the length of the course to 18 months or 2 years and of demanding from applicants for admission a higher standard of previous training and experience. The aim would then be to turn out fully qualified anaesthetists at the end of the course.

#### Keeping in touch

Perhaps the most important feature of the whole project is the fact that at least 250 physicians interested in anaesthesiology—trainees, instructors and consultants—have at one time or another been in contact with each other and with WHO. This contact is being maintained partly by direct correspondence between individuals but also by means of a newsletter *Anaesthesia News Copenhagen* which is sent four times a year to all those who have taken part in the courses. To strengthen the contacts still further and to provide a follow-up to the Copenhagen courses, WHO is arranging a seminar on recent advances in anaesthesiology to take place somewhere in Europe in 1959. A number of former trainees will be invited to attend this advanced course.

#### *Russian translation of WHO monograph on poliomyelitis*

A Russian translation of the monograph *Poliomyelitis* (B 11 Health Organization Monograph Series No. 26) was published in 1957 by the State Medical Literature Publishing House, Moscow. The translation is by B. I. Kaplan, Dyubobes and M. A. Voroshilova. This monograph was originally published by WHO in English and French in 1955 and a Spanish version is now in preparation.

## PROGRESS IN MALARIA ERADICATION IN TAIWAN

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<sup>1</sup> Based on report on malaria control and eradication in Taiwan (1955) June 1955 prepared by the Taiwan Provincial Malaria Research Institute (TAMRI) and the WHO Malaria Technical Team in Taiwan. A shortened version of this report is given in the Bulletin of the World Health Organization.

centres and 368 health stations which act as headquarters for various health projects including malaria eradication. Malaria control was in fact the first project conducted on an island wide scale whose services were integrated with those of the local health stations.

### Endemicity situation in 1951

During the war the malaria treatment stations set up by the Japanese ceased to function and malaria spread unchecked. There are no figures showing the extent of the 1942-1945 epidemic. However, malaria metric surveys carried out in 1946 indicated parasite rates of 20-40% among sample groups of children in the primary schools.

The endemicity situation was as follows at the outset of the operations: hyperendemic regions in the foothills and in the mountains up to a height of 1000 metres; hypoendemic regions at altitudes of over 1000 metres in the municipal centres; the south western coastal area and the adjacent islands; meso-endemic regions in the rest of the territory.

### Measurement of malaria

In order to study malaria epidemiology, define the areas to be sprayed, assess the progress made after each annual spraying campaign and track down remaining foci of transmission in the treated areas, a certain number of parasitological survey techniques were developed. These called for extremely thorough standardization and co-ordination. We shall deal here in particular with those used in surveys covering the whole territory.

#### *Parasite density*

On a fixed date — 17 December — every year since 1952, 150 local malaria technicians have each taken blood samples from 100 pre-school age children living in the most malarious of the villages served by their health stations. These samples — averaging from 14,000 to 15,000 — are immediately sent to the headquarters laboratory where more than 100 microscope fields of each thick smear are examined in about three mi-

nutes. The average parasite rate thus determined for this age group fell from 9.74% in 1952 to 4.50% in 1953 after the first spraying campaign, then to 1.18% (1954) 0.20% (1955) and 0.01% (1956).

From December 1954 to May 1955 another survey, this time covering infants, was carried out to determine whether new infections had occurred after two DDT treatments. Out of the total of 63,460 smears examined, only 8 were found positive, 5 being infected with *falciparum* and 3 with *vivax*.

#### *Spleen enlargement*

Several national spleen surveys have been carried out in all the primary schools of the island except in the centres of the large towns using the Hackett technique as modified by Chen Wu & Hsieh. In the first survey in 1952, sample groups of 50 schoolchildren from the most malarious village in each township were examined. In the course of the second and most extensive survey in 1953, all the primary schools of the island were visited by WHO and TAMRI malaria logists. In each school, a group of 200 children from the elementary classes underwent a spleen examination. 147,089 samples were prepared and examined. The 1955 survey was restricted to one school per township, namely the one which had previously given the highest spleen rate. The average spleen rate for the whole island obtained in these surveys was 25.52% in 1953, with an average enlarged spleen of 1.66, and 11.71% in 1955, with an average enlarged spleen of 1.29.

#### *General morbidity*

In order to collect other epidemiological data, house to house fever case surveys were also carried out after each spraying campaign in regions which had formerly been very malarious. Such surveys constitute the principal means of detecting residual cases, as we shall see later on.

#### *Study of the vectors*

Continuing after the war, work commenced by Japanese entomologists, research workers

such as Chow Watson Chang Tsene Hsieh and Pletsch have dissected a total of nearly 100 000 specimens of the various species suspected of playing some part in malaria transgression in Taiwan. Thanks to their patient investigations it was concluded that the main vector was *A. minimus minimus* one of the most widespread mosquitos particularly in the hill areas and in well irrigated districts. Study of the habits of this anopheline showed that it is very anthropophilic. In the daytime it is found in dwellings where it settles preferably under beds or other furniture as well as on ceilings and walls up to a metre from the floor. All this information was of great value to the engineers who developed the spraying technique.

So as to determine the effect of spraying and to detect any subsequent signs of insecticide resistance a certain number of collecting stations—ordinary dwelling houses—were visited once or twice monthly throughout the duration of the operations. Other untreated places (cattle sheds larval breeding places) were also regularly examined. Large periodical collections of adults and larvae at other sites in the island confirmed the information obtained by the collecting station system namely that the anopheline species had generally disappeared from dwellings after the first DDT spraying.

In certain areas *A. minimus minimus* was even eradicated. Such an achievement is sufficiently uncommon to be worth special mention. However it seems that this anopheline can maintain colonies in isolated areas of the bush without having access to human blood. So far there is no proof of the appearance of acquired resistance either behavioural or physiological in the case of *A. minimus minimus*. It is believed that other anophelines particularly *A. maculatus* may be responsible for the persistence of transmission in certain foci.

#### Insecticide spraying

The extent of the areas to be sprayed every year is based on the spleen rates of schoolchildren (35 or more in 1953 10/

or more in 1954). The spraying programme also covered townships with lower rates than these when they were surrounded by other townships requiring treatment.

The population protected by spraying was 1 526 000 in 1953 5 467 664 in 1954 5 640 325 in 1955 and nearly 7 000 000—the whole population of Taiwan apart from the centres of the large towns—in 1956.

#### Plan of operations

Once the area to be sprayed was defined it was divided into four regions to be treated one after the other. The headquarters engineering service then drew up the plan of operations (amount of insecticide number of sprayers vehicles local cost of operations number and training of personnel etc.) This plan was published in the *Provincial Gazette* a year before its application, in order to inform the local administrations in advance of the number of employees they would have to supply and the anticipated cost. The date and place of the training course were notified by circular letter to the administrations of the hsien and municipalities two months before the commencement of operations.

At the beginning of each annual spraying period a special training course was organized at the campaign headquarters for the 28 to 35 supervisors responsible for the programme in the hsien and municipalities. These supervisors subsequently directed regional training courses for those in charge of spraying in the townships. The latter in turn trained local sprayers and workers. At the end of this training period which lasted about a month spraying was commenced.

Operations commenced on the same day in all the townships of a given region. The visit of the team was notified to all the village headmen and in many cases the local press published articles on the malaria control campaign. On an average one spraying team treated the dwellings of 7000 persons in 60 working days.

#### Insecticides used

Throughout the control campaign an effective annual dose of 2 g/m<sup>2</sup> of technical DDT was used applied in the form of 75 /



DDT water dispersible powder Since 1956 this has been replaced by a DDT BHC mixture in a dose of 17 mg of BHC gamma isomer and 2 g of technical DDT per square metre At the outset all the DDT was imported from the United States In 1953 a national factory commenced manufacture and supplied one third of the insecticide required in 1953 half in 1954 four fifths in 1955 and the total amount in 1956

As regards equipment it may be mentioned that a factory in Taipeh has produced an excellent compression sprayer as well as a multi outlet pump

### *Difficulties encountered*

In 1955 spraying teams were refused admittance to a number of houses as a result the dwellings of 3.7% of the population to be protected could not be treated Many reasons were given for these refusals—ineffectiveness of DDT against insect pests damage to silkworm and fish breeding stains on walls and furniture A study of the mortality caused among silkworms and fish seedlings made it possible to deal with one of these causes of complaint Another was tackled in 1956 by the decision to use a mixture of DDT and BHC which to the general satisfaction killed a high proportion of insect pests

A further difficulty is the increasing reluctance of the municipal mayors and councilors to provide funds for malaria control as it is hard for them to realize that it costs as much to eradicate the few remaining cases of malaria as it formerly did to combat generalized malaria So far however thanks to local public health personnel the programme has been effectively continued

### *Surveillance stage*

The initial surveillance operations date back to December 1954 When it was decided to attempt to eradicate malaria a complete surveillance system was organized including not only the detection study and elimination of residual foci of transmission but also the detection and treatment of residual cases of infection

Any area where transmission and residual cases of infection are still found after DDT treatment is regarded as a residual focus of transmission The residual cases of infection are divided into three categories (1) infections among children born after the initial spraying campaign (2) *falciparum* infections (excluding infections in group (1)) (3) *vivax* and *malariae* infections (excluding infections in group (1)) Most persons carrying parasites are found among adult fever cases (0.26% in 1956) From December 1954 to June 1957 out of 78 618 infants and children born after the commencement of the first spraying campaign only 19 gave positive blood tests

At present it is estimated that various types of indigenous malaria are still prevalent in 84 townships with a total population of more than 12 million A fifth of this population is under strict surveillance

A body of technicians well trained in surveillance methods—preparation of blood smears microscopic examination treatment of malaria sufferers—has been stationed at strategic points in all the regions under surveillance Each technician is allowed three months in which to tour an area with 5000 to 6000 inhabitants visiting private persons hospitals establishments factories plantations etc

The details given by public health officers or private practitioners represent what is termed passive case finding Since July 1955 notification of malaria cases has been compulsory and treatment is free However probably owing to lack of proper information physicians have not collaborated to the extent expected

In order to eliminate foci of transmission recourse is had to emergency spraying and to the mass treatment of the whole population of the focus The treatment schedule so far employed—a single dose of amodiaquine or chloroquine (10 mg or 12 mg respectively per kg of body weight)—has certainly led to a great reduction in the parasite rate (from 6% to 0.66% in certain villages) but it is hoped to obtain still better results in years to come by the regular administration of these drugs and by also administering a dose of 15 mg of primaquine per day for two weeks in cases of *vivax* or *malariae* infection

## General organization of the programme

At the outset in accordance with the agreement reached with WHO the technical and general direction of the operations was assumed by the WHO Senior Malaria Adviser on behalf of the Chinese Government. The Regional Director of WHO for the Western Pacific and the Regional Malaria Adviser gave technical advice. However the responsibility for directing operations was gradually transferred to the TAMRI personnel and by 1955 this transfer was complete. From then onwards the members of the WHO team acted solely as consultants. It was also in 1955 that the two malaria control programmes—military and civil—were amalgamated. As far as possible the campaign headquarters has retained control of every thing connected with general planning and programme assessment, gradually allowing the health centre personnel to take over the direction of local operations.

At first sight it would seem that a programme on this scale must have called for—and would still need—a very large staff. This is by no means the case. In June 1957 TAMRI employed 77 agents including 6 malariologists, 3 entomologists and 22 parasitological and entomological technicians. These are the only persons working for the project full time. Apart from sprayers and workmen recruited by the townships on a temporary basis, the rest of the personnel required consists of physicians, health engineers and other workers in the public health centres and stations who are assigned to malaria control work for two months every year.

From May 1952 to the end of 1956 more than US \$5 000 000 were expended—including \$4 000 000 for control operations—or rather more than \$0.50 per inhabitant.

The contribution of the Chinese Government (about US \$2 300 000) has served to cover wages, transport costs, cost of equipment and supplies purchased in the country and all maintenance expenses. American funds (about US \$2 600 000) have been used primarily for the purchase of DDT and

sprayers as well as for wages and transport costs. The salaries and travel expenses of the WHO experts have been paid by the Organization. The technical documentation and part of the equipment not available in the country have been supplied by WHO using United Nations Technical Assistance funds (in all US \$174 000).

## Continuation of the eradication campaign

Even if the antimalaria programme were to end now, the efforts of the past seven years would not have been in vain. For many lives have been saved and the national economy has been considerably strengthened as a result. Nevertheless one must be realistic. The present low endemicity represents an epidemic potential and serious outbreaks could occur in a year or two. For this reason epidemiological work should be continued with unremitting energy so as to determine what factors help to maintain transmission (other vector species, natural and acquired anopheline resistance to insecticides, seasonal movements of the population, faulty spraying, primitive housing conditions, etc.).

In 1958 the spraying programme will protect some 400 000 inhabitants; it will cover all the residual foci of transmission discovered in the last two years and all former hyperendemic regions which still have a population of *A. minimus minimus* and where transmission seems to persist. After 1958 systematic spraying will cease except locally in emergency cases. From then onwards it will in fact be more economical to employ medicinal treatment for the few remaining cases of malaria.

The success of the last phase of surveillance will depend in the final analysis on the inhabitants themselves, for it is to be feared that they will see less and less reason for opening their doors to sprayers and investigators and submitting to the necessary examinations. They can hardly be blamed for this, but an additional effort to enlighten them is essential and the Taiwan public health personnel should certainly be able to undertake this task.

## EXPERIMENTS WITH FREEZE-DRIED BCG VACCINE

Liquid BCG vaccine is sensitive to heat and must be kept at a temperature of 2-4 C during storage and transport if it is to be prevented from losing its potency. This requirement creates serious problems in large scale BCG vaccination programmes such as those carried out under the auspices of WHO and UNICEF in tropical countries and in regions where communications are slow and difficult.

Assessment of the results of mass vaccination campaigns has shown that the degree of allergy provoked by BCG is not always up to the desired level and on occasions may be quite low. One of the reasons for this is believed to be failure to keep the vaccine at the proper temperature during storage and transport.

In Japan workers have for a long time been experimenting with freeze dried BCG vaccine in an endeavour to increase the stability at higher temperatures. Several papers on this subject have been published in the WHO Bulletin and Y. Obayashi has written a monograph describing exhaustive studies on freeze dried BCG vaccine.<sup>1</sup>

Recently the effects of incorporating certain adjuvants in the vaccine to improve its heat stability have been examined.

The addition of 1.2% sodium glutamate for example has given promising results and the product appears to be remarkably stable to heat.

At first freeze dried vaccines were used only on a limited scale and in national projects but in view of the needs of the WHO/UNICEF mass vaccination campaigns the WHO Tuberculosis Research Office (TRO) decided to study the possibilities of using freeze dried BCG vaccine with sodium glutamate as adjuvant on the international level. The results of the first of these studies are reported in a recent number of the WHO Bulletin.<sup>2</sup>

A series of field trials with this product

was commenced in April 1956 with the vaccination of schoolchildren in Ilorn (Niassa). Two freeze-dried vaccines were used—one with 1% sodium glutamate and the other with 2% sodium glutamate as adjuvant. The vaccines were stored for 15-16 months at 2-4 C, and thereafter some ampoules of each were kept for one month at temperatures of (a) 20 C during the day and 37 C during the night (to simulate the oscillations of temperature observed in certain tropical regions) (b) 37 C or (c) 42 C. For the purpose of comparison fresh liquid vaccine was used, injected 13-15 days from the date of preparation after having been kept at a temperature of 2-4 C.

Before vaccination the tuberculin test was applied to determine which of the children showed tuberculin sensitivity (5 TU injected intradermally into the dorsal surface of the left forearm). Vaccination was then performed on the 368 children who did not react to the test or who reacted with a local induration of less than 10 mm transverse diameter. 0.1 ml of reconstituted freeze dried vaccine equivalent to 0.05 mg of bacilli (moist weight) or 0.1 ml of fresh liquid vaccine equivalent to 0.075 mg of bacilli (moist weight) was injected intradermally into the left deltoid region. The vaccines were used in rotation.

Six months after vaccination the tuberculin test was again applied (5 TU in a volume of 0.1 ml administered intradermally) to determine the level of the allergy produced by the vaccine. The tests were read three days after injection of the tuberculin; the transverse diameter of the palpable induration being measured.

Two important findings were (a) the freeze dried vaccine to which sodium glutamate had been added and which had been stored for 15-16 months at 2-4 C produced the same level of allergy as did fresh liquid vaccine and (b) 30 days exposure of freeze dried vaccine to temperatures of 20°-37°C, 37 C and 42 C caused only a very slight loss of allergenic potency. The lesion producing

capacity of the freeze-dried vaccine was found to show a similar trend to the allergenic potency a slight reduction in the mean size of the lesions being observed with vaccines stored at the highest temperatures

On the basis of these findings it may be affirmed that freeze-dried vaccine stabilized with sodium glutamate as used in this study is remarkably heat resistant Unlike the liquid vaccine it suffers no significant loss of allergenic potency even after 30 days exposure to tropical temperatures

The level of allergy was determined six months after vaccination and it remains to be seen whether the level will be maintained over a longer period

A start has recently been made with the industrial production of freeze-dried vaccine stabilized with sodium glutamate If the long term results are as good as those obtained so far an important step will have been taken towards the solution of a major technical problem connected with mass BCG vaccination

## REACTIONS FOLLOWING VACCINATION AGAINST PERTUSSIS

The effectiveness of pertussis vaccination has now been amply proved but unfortunately the procedure is not completely free from risk This is a drawback that applies however to several other types of vaccination e.g. against smallpox yellow fever rabies and typhoid What are the risks involved in pertussis vaccination and to what extent are they outweighed by the undoubted advantages of this method? This question is answered by Dr W C Coekburn in an article which will shortly appear in the *Bulletin of the World Health Organization* and is summarized below

### Reactions

Tenderness at the site of injection inflammation swelling and fever are sometimes seen following pertussis vaccination These reactions remain mild when the vaccine either alone or associated with toxoids does not contain alum It appears that this substance which is present in certain vaccinal preparations aggravates the reactions and leads to more frequent formation of sterile abscesses Alum does not augment the protective power of pertussis vaccine consequently its addition to the plain vaccine is unnecessary Neither is its use justified in mixed vaccine preparations containing pertussis vaccine since the latter itself acts as synergist with respect to the toxoids in the mixture The route of injection and the volume inoculated also

influence the severity of the reactions In general intramuscular injection is better tolerated than subcutaneous injection

### Sequelae

Occasionally injections of pertussis vaccine have been followed by more serious and lasting complications of a neurological nature Although all encephalopathies occurring after pertussis vaccination cannot be attributed to the vaccine authentic cases have been reported during the last 20 years These have included convulsions and some times hemiplegia or other permanent brain lesions The pathogenesis of these encephalopathies is still unknown, but it seems to differ from that of cases associated with other forms of vaccination

The risks are extremely small however when it is remembered that only a hundred or so cases have been described in the literature for all the hundreds of millions of vaccinations carried out It should be borne in mind that children may suffer from serious cerebral disorders during the course of most infectious diseases including infections of the respiratory tract, and that long before the use of pertussis vaccine acute cerebral paralysis of childhood had been described with symptoms closely resembling those of post vaccinal accidents The significance of such accidents must therefore be interpreted with great care particularly if

they occur several days or even weeks after vaccination. According to published reports it would seem that accidents attributable to pertussis vaccine generally occur within the 72 hours following the injection.

During vaccination campaigns carried out in England in recent years two groups totalling 30 000 children were followed up with special care for three years after vaccination. No serious neurological sequelae were seen although there were cases of convulsion without permanent injury which could not be definitely attributed to vaccination. During these trials care was taken not to vaccinate any child with a history of convulsions, epilepsy, mental deficiency, encephalitis or other similar complaints. This precaution was taken on an empirical basis for there is no proof that such a history creates conditions favouring the appearance of neurological sequelae. The decision seems a wise one however although paediatricians agree that vaccination involves less risk for children suffering from convulsive disorders than does pertussis itself. As a further precaution no child was vaccinated less than one month after measles, mumps, influenza or vaccination against smallpox.

Another serious complication first reported in 1950 is the provocation of an attack of poliomyelitis, sometimes with paralysis of the limb in which the injection has been made. A special study of this question carried out under the auspices of the Medical Research Council of Great Britain led to the conclusion that the injection of pertussis vaccine either alone or admixed with plain toxoids or toxoids to which alum has been added carries a definite risk. This risk has been found to be greatest in the case of mixed antigens to which alum has been added. The frequency of paralysis during the total period of these studies is estimated to be as follows: 1 case in every 15 000 injections of mixed antigens with the addition of

alum, 1 case in every 20 000 injections of mixed antigens without the addition of alum, 1 case in every 170 000 injections of plain pertussis vaccine.

These figures give an approximate idea of the extent of the risk which will remain a source of anxiety until it is known whether poliomyelitis vaccination gives protection against accidents of this nature.

The report of the Medical Research Council revealed an unexpected fact. It seems that the risk of induced poliomyelitis is at least as high in the three months preceding the epidemic poliomyelitis period as during that period itself. Consequently pertussis vaccination campaigns should be intensified during the winter. But vaccination cannot be limited to this season alone for it is essential to be able to vaccinate infants at any time as pertussis is particularly dangerous during the first months of life.

#### Assessment of the risks

The risks of pertussis vaccination can only be rightly assessed in relation to those of the disease itself. Pertussis is a serious disease and the chances of a fatal outcome or the development of grave neurological or respiratory complications are by no means negligible. In 1951, a study by the Medical Research Council put the proportion of complications occurring in an unvaccinated control group of children at 4% (calculated on 687 cases). The same study reported that 60% of the children had suffered from paroxysmal coughing for eight weeks or more. The risks attendant on vaccination are very much smaller and there can be no doubt that it should be generally adopted so as to reduce the incidence of the disease. In addition precise information on post-vaccinal accidents should be obtained from all countries and research should be continued on the pathogenesis of encephalopathy and on the development of a safer vaccine.

## EXOPHILY IN ANOPHELINES AND MALARIA CONTROL

The exophily shown by anophelines—the tendency of these mosquitoes to rest outside in the daytime rather than in man-made shelters—may help to maintain a certain reservoir of malaria infection (residual malaria) in regions where a well-organized campaign employing residual insecticides would otherwise be expected to eradicate the disease.

In Africa in particular the exophily of *A. gambiae*, one of the chief malaria vectors and one of the species of *Anopheles* showing the greatest biological variations, is a factor that must be taken into consideration in organizing control measures. Two authors have recently dealt with this question in the *Bulletin of the World Health Organization*. Gillies<sup>1</sup> has discussed in detail the problem of exophily in *A. gambiae* on the basis of studies made in Tanganyika. He considers in turn the different forms of exophily as classified by Senior White. These are obligatory exophily when there are no houses in the area inhabited by the mosquito as happens in the case of *A. culicifacies* in the uninhabited jungle of Ceylon; facultative exophily when there are numerous houses and shelters but one of the preferred hosts is to be found outside; deliberate exophily when the mosquito either bites indoors but leaves before daylight (*endophagic*)—as in the case of *A. maculatus* in Malaya—or bites out of doors and avoids resting sites in houses (*exophagic*), e.g. *A. coustani* and *A. pharaensis*. The stage of gonotrophic development of the females—unfed, gorged with blood or gravid—is also of significance in connexion with exophily.

What is the role of exophily in the maintenance of endemic malaria when residual insecticides are used for systematic house spraying? As regards *A. gambiae* in Africa Gillies concludes that at present it is impos-

sible to state with confidence that transmission will be completely interrupted by insecticide spraying regardless of local conditions or the degree of endemism. It will not be possible to be certain of this until the behaviour of the exophilic groups and the influence of insecticides on them have been accurately determined. If their importance is underestimated there is a risk that low-grade transmission will be maintained and that this might be wrongly attributed to a change in the behaviour of the mosquito or in the response of the species to insecticides.

The article by Gillies prompted J. Sautet<sup>2</sup> to point out that exophily was studied long before the use of residual insecticides for malaria control. In the Lebanon in 1934 exophily was detected among populations of *A. sacharovi* and *A. sergenti* found in caves, holes in walls or in fields. Similarly in Corsica in 1935 *A. maculipennis labbranchiae* was observed to exhibit exophilic tendencies varying with the season or the strength of the wind. In the Sudan research on the exophilic nature of *A. gambiae* has confirmed the possibility of "open air malaria." Female anophelines gorged with blood were found in precarious resting places such as holes in silk-cotton trees (*Bombax*) and fissures in bark. These mosquitoes became aggressive at nightfall and were distinctly anthropophilic. In Mauritania outdoor resting places of *A. gambiae* have been found in deep holes. Numerous malaria control campaigns have not succeeded in destroying the exophilic group—whether anthropophilic or zoophilic—of the *A. gambiae* population in the islands of Mauritius, Réunion and Madagascar. Referring to his own investigations and those of his co-workers, Sautet states that they have found exophily wherever they looked for it, particularly among species regarded as domestic.



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Assessment

The risk is not right the disease a the development of respiratory negligible. Research complicates control of on 687 cases 60% of paroxysms more. There are very doubt that so as to. In addition vaccinal all countries continued or and on 1

panded Programme of Technical Assistance the Board noted that the funds expected to be provided for Category I projects in 1959 totalled \$4 238 000

### Malaria eradication

In pursuance of WHO's policy of securing, as rapidly as possible the complete eradication of malaria from the world the Director General has now drawn up a detailed programme covering the operations planned for the next five years<sup>1</sup>. To ensure that the carrying out of the programme does not prejudice other activities the Director General has established a Malaria Eradication Special Account supplementary to the regular budget and Technical Assistance funds. The total resources available in the account at present are \$5 112 000 of which \$5 000 000 have been contributed by the United States of America. As the estimated expenditure for 1958 alone is \$5 058 000 some concern was expressed by members of the Board regarding the financing of the programme during succeeding years. Dr Hyde (United States of America) stated that the United States intended to make substantial contributions over the next four years and the Director General informed the Board that he had already started negotiations with several countries in the hope of obtaining additional funds. It was also possible that contributions might be forthcoming from a number of private organizations from individuals and from manufacturing firms.

Several members stressed the fact that an appeal for funds would have little chance of success unless it were preceded by a publicity campaign to acquaint the general public with the extent of the malaria problem and with the details of WHO's eradication programme. The Director General said that in this context it should not be forgotten that the eradication of malaria would have important repercussions on economic development. In fact the concept was based on the belief that eradication would open the way to

economic advance leaving health administrations free to tackle other outstanding health problems. The Board expressed the hope that governments able to do so would make voluntary contributions to the Special Account and requested the Director General to take the necessary steps — including adequate publicity — to obtain additional funds whether from governmental or from private sources.

The concept of malaria eradication is already making good headway in the various regions. In the Americas it has been agreed that malaria is the most important problem facing the Region and definite plans have now been drawn up for all except two of the countries. It is estimated that completion of the eradication programme in this Region will cost altogether \$145 000 000 of which \$100-105 million will be met by the governments of the countries concerned while a further \$20 000 000 is expected to be borne by UNICEF. In the Eastern Mediterranean Region malaria eradication programmes are already in operation in four countries and are planned for seven others. A special malaria eradication unit is to be established to co-ordinate and supervise the work. Most of the countries of South East Asia and a number of those in the Western Pacific Region have also adopted eradication as their objective and an eradication plan is being prepared for the south-eastern part of Africa. Altogether 76 countries have already instituted or are planning to institute eradication programmes in nine of these eradication has been practically achieved and in seven more it is very far advanced.

### Reports from the regions

The Board reviewed the reports of the various regional committees on the sessions held last September. These sessions have already been described briefly in preceding numbers of the Chronicle<sup>2</sup>. The Board showed interest in the progress that has been made in the campaign against smallpox. In the Western Pacific Region practically no outbreaks have been reported during the

<sup>1</sup> A special article on WHO malaria eradication programme will be published in the forthcoming number of the Chronicle.

past four years and for several years no cases have been confirmed in North or Central America or the West Indies. An improvement in the situation has also taken place in Africa. In South East Asia however there was a rise in the incidence of smallpox in 1957. It was pointed out that in this Region the number of cases can be expected to fluctuate for many years to come until medical services can be extended to cover the vast rural areas.

The Regional Committee for the Americas reported that although the eradication of *Aedes aegypti* is not yet complete no outbreaks of yellow fever transmitted by this vector occurred in urban districts during 1957. Outbreaks of jungle yellow fever — transmitted by species of *Haemagogus* — occurred in six countries however and another of the periodic waves of the disease began to spread southwards from the Amazon valley.

In this Region the decline in tuberculosis has been spectacular. In the United States mortality is now around 8.5 per 100 000 (1956) compared with 26.3 per 100 000 in 1949 i.e. a drop of 68% while in Chile mortality has fallen by 69% from 201 per 100 000 in 1949 to about 63 per 100 000 in 1956.

#### Proposal to include sports medicine in the programme of WHO

The Governments of Denmark, Finland, Norway and Sweden had submitted to the Board a formal proposal that sports medicine should be included in the programme of WHO. A similar proposal had been made by Bulgaria at the First World Health Assembly in 1948. Scientific information on physical training had subsequently been collected from various sources and submitted to the Third World Health Assembly which had decided to postpone further action. In support of the present proposal it was pointed out that outdoor games and athletics are now practised in schools throughout the world and the interest in sport is retained in later life. Sport it was said is important both for physical and mental health and

sports medicine is developing into a new specialty. It was thought that WHO might give a lead in stimulating research into the various problems involved and in guiding its application. Several members expressed a desire for a more precise definition of the term "sports medicine" and for a clarification of what the authors of the proposal had in mind. There was some concern lest expenditure on such a project might be prejudicial to other activities. The Board requested the Director General to examine the proposal further and to submit a preliminary report to the Eleventh World Health Assembly on the kind of programme that might be undertaken by WHO in this new field.

#### Emergency assistance to Ceylon

Following the severe floods in Ceylon at the end of last year WHO made available supplies of cholera and TAB vaccine to the value of \$11 500. Since then a request had been received from the Government of Ceylon for further supplies bringing the total cost up to \$20 000. The Board approved the action already taken and authorized the Director General to provide the additional assistance. The Government of Ceylon has stated its intention of reimbursing some if not all of the cost of the TAB vaccine.

#### Other business

A further major task of the Board was the examination of reports from expert committees and study groups. The discussions on these reports are summarized in a separate article below.

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The Eleventh World Health Assembly will open in Minneapolis Minnesota, on 28 May 1958 and will be preceded by a special Tenth Anniversary Commemorative Session

from 26 to 28 May The twenty second session of the Executive Board will also be held in Minneapolis commencing on 16 June 1958

## REPORTS OF EXPERT GROUPS REVIEWED BY THE EXECUTIVE BOARD

During its twenty first session the WHO Executive Board reviewed a number of technical aspects of the Organization's work—reports of expert committees reports of study groups conferences etc Some of the points that emerged during the discussions are summarized below

### Reports of expert committees

#### *Biological standardization*

The eleventh report of the Expert Committee on Biological Standardization which met in Geneva from 16 to 21 September 1957 deals with problems relating to the international standardization of a large number of antibiotics hormones antigens antibodies and other biological substances The number of antibiotics for which international standards are available has been brought up to eleven An international unit for pertussis vaccine is defined and the possibility of standardizing poliomyelitis vaccine and cholera vaccine discussed The international standardization of smallpox vaccine rabies vaccine and swine erysipelas vaccine is in progress Steps are being taken to establish international reference preparations for three types of poliomyelitis sera, syphilitic human serum yellow fever immune serum anti streptolysin O and Rhesus blood typing sera The Committee decided not to set up international reference preparations for leptospirosis vaccines since their antigenic composition varies widely in different parts of the world according to the prevalent strain of leptospira In the discussion of the report by the Executive Board Professor Canaperia

(Italy) said he thought there would be some advantage in having international reference preparations for leptospirosis vaccines that would facilitate evaluation of the antigenic content of other vaccine preparations On behalf of the Director General it was stated in reply that, while this view was correct, the problem had been considered too complex to be tackled at that time by the Committee this did not mean however that the possibility of setting up such reference preparations would not be discussed at some future date

#### *International Pharmacopoeia*

The Board had before it the fifteenth report of the Expert Committee on the International Pharmacopoeia as well as the seventh report of the Sub-Committee on Non Proprietary Names It was explained on behalf of the Director General that the main task of the Sub-Committee which met from 12 to 15 June 1957 had been to study suggestions for non proprietary names received from various sources It had selected 159 and the list would shortly be published in the Chronicle (see page 102 of this issue) The names recommended by the Sub-Committee in previous reports were being increasingly used throughout the world in official publications and as a result there was less confusion than there had been in the past

The fifteenth report of the Expert Committee on the session held from 2 to 8 October 1957 will not be published as the material will be included in the *International Pharmacopoeia* The main topics that had been discussed were the monographs to be

past four years and for several years no cases have been confirmed in North or Central America or the West Indies. An improvement in the situation has also taken place in Africa. In South East Asia however there was a rise in the incidence of smallpox in 1957. It was pointed out that in this Region the number of cases can be expected to fluctuate for many years to come until medical services can be extended to cover the vast rural areas.

The Regional Committee for the Americas reported that although the eradication of *Aedes aegypti* is not yet complete no outbreaks of yellow fever transmitted by this vector occurred in urban districts during 1957. Outbreaks of jungle yellow fever — transmitted by species of *Haemagogus* — occurred in six countries however and another of the periodic waves of the disease began to spread southwards from the Amazon valley.

In this Region the decline in tuberculosis has been spectacular. In the United States mortality is now around 8.5 per 100,000 (1956) compared with 26.3 per 100,000 in 1949 i.e. a drop of 65%, while in Chile mortality has fallen by 69% from 201 per 100,000 in 1949 to about 63 per 100,000 in 1956.

#### Proposal to include sports medicine in the programme of WHO

The Governments of Denmark, Finland, Norway and Sweden had submitted to the Board a formal proposal that sports medicine should be included in the programme of WHO. A similar proposal had been made by Bulgaria at the First World Health Assembly in 1948. Scientific information on physical training had subsequently been collected from various sources and submitted to the Third World Health Assembly which had decided to postpone further action. In support of the present proposal it was pointed out that outdoor games and athletics are now practised in schools throughout the world and the interest in sport is retained in later life. Sport it was said is important both for physical and mental health and

sports medicine is developing into a new specialty. It was thought that WHO might give a lead in stimulating research into the various problems involved and in guiding its application. Several members expressed a desire for a more precise definition of the term sports medicine and for a clarification of what the authors of the proposal had in mind. There was some concern lest expenditure on such a project might be prejudicial to other activities. The Board requested the Director General to examine the proposal further and to submit a preliminary report to the Eleventh World Health Assembly on the kind of programme that might be undertaken by WHO in this new field.

#### Emergency assistance to Ceylon

Following the severe floods in Ceylon at the end of last year WHO made available supplies of cholera and TAB vaccine to the value of \$11,500. Since then a request had been received from the Government of Ceylon for further supplies bringing the total cost up to \$20,000. The Board approved the action already taken and authorized the Director General to provide the additional assistance. The Government of Ceylon has stated its intention of reimbursing some, if not all, of the cost of the TAB vaccine.

#### Other business

A further major task of the Board was the examination of reports from expert committees and study groups. The discussions on these reports are summarized in a separate article below.

The Board had received applications from the International Fertility Association, the International Union of Local Authorities, and the Federation Internationale de Medecine Sportive asking to be admitted into official relations with WHO. It was noted that these Organizations met the requisite criteria and it was therefore decided to accept the applications.

The Committee suggested a classification to avoid confusion of poliomyelitis with other diseases and it recommended further research on inactivated and live virus vaccines on combinations of other immunizing agents with poliomyelitis antigens and on improved laboratory procedures

Professor Pesonen (Finland) praised the report and offered a number of comments. The epidemiological studies advocated by the Committee though providing the best data for assessing actual needs required a great deal of work, time and money. He reported a field study recently carried out in Finland and not yet published. The distribution of poliomyelitis antibodies in five communities had been found to be statistically the same in every age group. He agreed that the term "non paralytic poliomyelitis" should not be used particularly during epidemics as many cases of aseptic meningitis and meningoencephalitis might easily be so described. The report gave a very valuable account of diseases resembling poliomyelitis and it was important to disseminate that knowledge among workers in the field. He also endorsed the Committee's recommendation that experiments with live attenuated vaccines should be continued and said it would only be a matter of time before it would be possible to use them on a wider scale. Their administration was technically easier and would meet with less opposition from those who resisted inoculations in principle.

Or Metcalfe (Australia) said that since 1955 Salk vaccine had been distributed in Australia as rapidly as it could be produced. Up to the present time every child of school age had received three injections and some states had already started a vaccination programme for adults up to 45 years of age. Last year there had been only 138 cases of poliomyelitis compared with over a thousand cases in previous years. There had been no complaints of reactions and no case of poliomyelitis following injections.

In answer to questions from the Chairman Sir John Charles (United Kingdom) it was stated that although there was laboratory evidence that antibodies were produced following intracutaneous inoculation there

was no statistically accepted field evidence of protection comparable to that from the United Kingdom and United States field trials. The Committee had taken the view that the practical results were not yet good enough to allow any margin for reducing the dose by means of intracutaneous inoculation or the use of adjuvants.

### *Brucellosis*

The joint FAO/WHO Expert Committee on Brucellosis met from 7 to 12 October 1957 and subsequently submitted to the Board its third report which gave an up-to-date account of knowledge of the subject. Particular attention had been paid to *Brucella melitensis* infection in sheep and goats the main source of human infection. This form of brucellosis constitutes a serious economic and public health problem in many countries and FAO in collaboration with WHO has sponsored both laboratory and field work aimed at controlling the infection. Great efforts have been made to develop a suitable vaccine and FAO and WHO are already making joint plans for carrying out field trials of certain selected vaccines that have shown promise in laboratory experiments.

Professor Canaperia (Italy) asked whether research workers had been able to develop methods for distinguishing between the natural antibodies of the disease and the antibodies produced by the vaccine in animals. In reply it was stated that certain tests on milk whey serve to give some indication but no absolutely reliable techniques have yet been developed and research is continuing. In an answer to a further question from Professor Canaperia regarding evidence that vaccination of humans with Strain 19 might have a protective value it was pointed out that Strain 19 has produced reactions and illness in humans in some instances. A living vaccine indistinguishable from Strain 19 has been widely used in the USSR where several million persons have been vaccinated but sufficient first hand information is not yet available to enable the experts to pass a final judgement. WHO's present policy is to encourage research on a killed vaccine for

included in the supplement to volumes I and II of the *International Pharmacopoeia* specifications for reagents problems arising from the rapidly increasing number of new pharmaceutical preparations the possibility of publishing individual specifications without waiting for the publication of the *International Pharmacopoeia* itself and questions relating to the second edition of the *International Pharmacopoeia*

### *Addiction producing drugs*

The Expert Committee on Addiction Producing Drugs had submitted its eighth report following a session held from 14 to 19 October 1957. The Committee noted that governments are becoming more and more interested in technical assistance to combat drug addiction and expected an expansion of WHO activities as a result. The continued increase in the consumption of certain narcotic drugs was thought to be due in part to their wider use in medicine. The Committee recommended that a number of new drugs with morphine like analgesic and addiction producing effects be placed under international control and that the control measures already in existence for certain drugs should not be relaxed. Professor Campanella (Italy) asked what were the criteria employed by the Committee for deciding whether a drug had addiction producing properties. In the reply it was stated that the decisions of the Expert Committee were greatly influenced by the results of certain clinical experiments specially designed to test physical dependence on addiction producing drugs. One of the main centres for performing such tests is at Lexington in the United States of America. There was some discussion regarding substitutes for diacetylmorphine (heroin). The Committee had debated this question at considerable length and decided not to issue a list of substitutes but to leave it to the individual physician to decide what drugs should be used in each case. This decision had been reached partly because a vast amount of literature about morphine like analgesics is already available.

### *Water fluoridation*

The Expert Committee on Water Fluoridation which met from 26 to 30 August 1957 considered that the prevention of dental caries could only be tackled on a wide scale by water fluoridation. In the United States of America some thirty million people living in fifteen hundred communities are already benefiting from this measure and the Committee could find no evidence that water with one part of fluoride per million impairs health. The Committee concluded that the efficacy, safety and feasibility of water fluoridation has been established though there are still a number of unsolved problems.

The statement in the report that "the effect of fluoride continues into adult life" was criticized by Dr Diaz Coller (Mexico). It was explained in reply that the Committee had considered that fluoridation prevented caries among children and that the effect persists for a considerable period. Dr Diaz Coller stated that he was anxious to dispel the impression that fluorides had a protective effect on adults. He also thought that more emphasis might have been placed on the fact that the amount of fluoride required is dependent upon climatic factors influencing the amount of water consumed. It was agreed that this was an important point which would undoubtedly be taken into account by public health authorities.

### *Poliomyelitis*

The second report of the Expert Committee on Poliomyelitis which met from 15 to 20 July 1957 was very well received by the Board and provoked a lengthy discussion. Part of the report deals with the large scale use of inactivated vaccines and with problems associated with their production. Recommendations are made concerning the organization of vaccination programmes and serological surveys and a better utilization of regional laboratories collaborating with WHO is advocated. A considerable portion of the report is devoted to the possibility of field trials with live poliomyelitis virus vaccine and the specifications of strains to be used.

national control authorities would be helped by having at their disposal detailed international recommendations on methods of assay and requirements for biological substances and that the acceptance of such recommendations would greatly facilitate the exchange of biological substances between countries.

The group considered requirements in respect of a number of vaccines, toxoids and antitoxins and drew up a general procedure for use in formulating international recommendations. First an expert on the substance in question would be asked to prepare an initial draft which would then be circulated to members of expert advisory panels and to national control laboratories for comment. Subsequently the definitive recommendations would be drawn up by a group of experts and the final draft submitted to Member States. Final acceptance of the recommended requirements would of course be left to the discretion of the national authorities.

#### *Chemotherapy and chemoprophylaxis in tuberculosis control*

As a number of countries had sought the help of WHO in organizing tuberculosis control programmes based on domiciliary chemotherapy, the Director General had decided to call together a group of experts to advise how such programmes could best be carried out. This group met from 23 to 25 September 1957 and its report has already been published. The main conclusions of the group are:

(1) Tuberculosis prevalence surveys should be encouraged.

(2) All known cases of pulmonary tuberculosis should receive chemotherapy in areas with a high prevalence of tuberculosis and inadequate facilities; this could be given on an ambulatory or domiciliary basis.

(3) Emphasis should be placed on the development of the most effective type of service for domiciliary chemotherapy.

In putting forward a minimum programme the group emphasized that its recommenda-

tions are intended to serve as a guide for pilot projects in selected areas rather than for country wide control operations. It recommended provisionally that in areas of high prevalence isoniazid (INH) might also be administered prophylactically to tuberculin reactors living in the same household with infectious patients.

In the discussion of the report several speakers underlined the importance of ensuring an adequate food supply for the patient and his family. Dr Moore (Canada) said that nutritional status was the crux of the whole problem. Under the Canadian tuberculosis programme among Indians it was the practice to remove undernourished patients from their families. The whole family was then given an adequate food supply over a six month period after which its members were re-examined. The supply of food was kept up after the patient had returned to his family until all danger of relapse was over. It was further pointed out by Dr Metcalfe (Australia) that the bread winner of a family would resist attempts to make him give up his work and have treatment unless some provision were made for his family. The removal of sources of infection of tuberculosis was a fundamental consideration which he thought had not received sufficient emphasis in the report.

In the reply on behalf of the Director General, it was agreed that an adequate standard of nutrition has long been recognized as a very important factor in resistance to tuberculosis and that the wisdom of providing chemotherapy in countries of low nutritional standards has often been questioned. On the other hand a research project set up in Madras two years previously with the help of WHO has indicated that even under these conditions the patient given domiciliary treatment with drugs makes as much progress as the patient given hospital treatment over a lengthy period.

#### *Classification of atherosclerotic lesions*

In 1955 a Study Group on Atherosclerosis and Ischaemic Heart Disease drew attention to the urgent need for the standardization of



possible immunization of humans against brucellosis and to try to obtain new information on the use of living vaccine for this purpose

In a statement on behalf of FAO it was pointed out that the satisfactory control of brucellosis is closely connected with the quantity and quality of the milk supply and that FAO and WHO are also working jointly on milk hygiene. Dr Togba (Liberia) asked whether world wide acceptance of pasteurization instead of the grading of milk was imminent. It was stated in the reply that the grading of milk is being used less and less and that the use of unpasteurized milk has been strongly condemned by the FAO/WHO Expert Committee on Milk Hygiene. The objective of WHO is to encourage the use of heat treatment (sterilization or pasteurization) as a means of eliminating the transmission of certain diseases through milk.

### *Nutrition*

In introducing the fifth report of the Joint FAO/WHO Expert Committee on Nutrition which met from 22 to 29 October 1957 it was explained on behalf of the Director General that this report differed somewhat from the reports of other expert committees because the main function of the Committee was to review past programmes and advise on future planning since it was first constituted in 1949 it had played an important part in co-ordinating the nutrition programmes of the two organizations. During the period reviewed in the report meetings of the FAO Committees on Calorie Requirements and on Protein Requirements had taken place. The Joint Committee had agreed that a further revision of the report on calorie requirements was unlikely to be necessary for some time to come whereas the report on protein requirements—a much more difficult and complicated subject—would probably need revision within a few years because of the rapid progress being made in this field. The studies on protein malnutrition are perhaps the most important of the continuing projects in the nutrition programme of the two organizations on which the Committee had been asked for advice.

The report also indicated the way in which the Committee thought a number of other problems should be tackled in the future including beriberi, nutritional anaemia, avitaminosis A and other nutritional deficiencies affecting the eyes. One section of the report dealt with the organization and evaluation of nutritional studies and it was emphasized that education should figure prominently in the programmes.

### *Food additives*

A review of the second report of the Joint FAO/WHO Expert Committee on Food Additives has already appeared in the Chronicle.<sup>1</sup> In the discussion of the report by the Board emphasis was laid on the importance of the Joint Committee's first recommendation namely that FAO and WHO should give every possible encouragement to research studies that might further the development of better methods for evaluating the safety of food additives. Dr Habernoll (Federal Republic of Germany) supported the recommendation that the problem of the carcinogenic and mutagenic action of food additives should be studied by a special group of experts and he endorsed the conclusion that no proved carcinogen should be considered suitable as a food additive in any amount. He also commented that foreign substances added unintentionally to food were at least as important as intentional additives. In reply it was stated that such substances would form the subject of future investigations.

### *Reports of study groups*

#### *Requirements for biological substances*

It was explained on behalf of the Director General that it was the object of WHO to draw up recommendations on aspects of the control of biological substances outside the terms of reference of the Expert Committee on Biological Standardization. A study group had been convened to give advice on these questions. The group which met from 7 to 12 October 1957 was of the opinion that

with ILO should be put in hand as soon as possible with a view to devising a scheme by which "health services could be provided in major ports to seafarers of all nationalities on a wider scale than at present." A resolution to this effect was subsequently adopted by the Executive Board

#### *Technical Conference on Insect Resistance*

In July 1957 a technical conference was held in Geneva for the purpose of stimulating and co-ordinating an international research programme on the problem of resistance to insecticides. The conference was attended by directors of the major laboratories who unanimously agreed to participate in an international programme of research and to extend an invitation to do so to laboratory directors not present at the conference. After a thorough study of the many aspects of the problem they drew up a list of specific recommendations for organizing and carrying out the programme.

Dr Jafar (Pakistan) asked questions about the resistance of *Anopheles gambiae* and of flies to DDT. In reply it was stated that there was no record of resistance to DDT in *A. gambiae*. Some observations made by Dr Murhead Thompson in 1948 had been interpreted by reviewers as indicating a developed behaviourist resistance. In fact they had shown that the spraying techniques had been at fault so that the insects received an exciting dose instead of a lethal one and escaped from the sprayed surfaces into window traps.

With regard to flies it was explained that the development of resistance was essentially a process of Darwinian selection. In the original population the genes responsible for resistance were extremely rare whereas in the population surviving insecticide treatment a high proportion of the insects carried these genes. When spraying with DDT like insecticides was first used against flies the fly population was reduced almost to the point of disappearance. Later it was discovered however that there were a very few survivors resistant to the insecticide and that when spraying was continued the percentage of survivors increased with each generation. Resistance to dieldrin appears to be acquired more readily than resistance to DDT and there is also the possibility that the use of dieldrin increases the number of eggs laid by survivors. Dr Togba (Liberia) stressed the importance of this phenomenon in connexion with the use of dieldrin in malaria eradication programmes and stated that he had seen places that were teeming with flies as a result of spraying with dieldrin.

The Executive Board authorized the publication in the Technical Report Series of the World Health Organization of all the reports of the expert committees with the exception of the one concerned with the International Pharmacopoeia (see page 85). Responsibility for authorizing publication of the reports of study groups and conferences rests with the Director General.

## *Epidemiological and Statistical Information*

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### **YELLOW FEVER IN 1957**

According to a note published in a recent issue of the WHO *Weekly Epidemiological Record* (No. 5 1958) 74 cases of jungle yellow fever were officially notified in America during 1957 including 35 in Colombia, 19 in Bolivia, 10 in Brazil, 5 in Venezuela, 3 in Peru and 2 in Panama. In Africa 3 cases were reported in 3 local areas of the Belgian Congo and 2 suspected (unconfirmed) cases in Nigeria.

pathological criteria and terminology in respect of atherosclerosis ischaemic heart disease and related conditions and suggested that WHO should call a meeting of experts to study this question. A Study Group on Classification of Atherosclerotic Lesions was accordingly convened by the Director General with assistance from the United States Public Health Service. The report before the Board contained a terminology and definition of terms recommended by the Study Group for the description of conditions observed post mortem and detailed methods for classifying and grading atherosclerotic lesions. The group had noted that there were marked geographical differences in mortality and morbidity from these conditions. Recommendations were also made regarding the co-ordination of environmental and epidemiological studies through regional centres, laboratories and hospitals. The suggestions were along similar lines to those followed by WHO in other fields but the full implications have still to be worked out.

### *Histological definitions of cancer types*

The decision to convene a study group on this question was the result of a resolution adopted by the Executive Board at its seventh session requesting the Director General to explore the possibility of WHO's organizing centres in several places in the world which would arrange for collection of human tissues and for their histopathological examination. A start has been made with types of cancer and the Study Group at its meeting from 24 to 28 June 1957 recommended that tumours of the oropharynx, lung, soft tissue and breast should be studied first. It was proposed that international centres should be set up for each of these types of tumour and the need for co-ordination with appropriate international non-governmental organizations was stressed. In reply to questions regarding the implementation of the group's recommendations it was stated that an Expert Advisory Panel on Cancer had been established and as a first step participants in the group had been appointed to it. Representation would be

broadened later. It had been decided to give priority to lung tumours and soft tissue tumours and negotiations were under way with two institutes that might serve as suitable international centres. It was agreed that it was important to avoid overlapping with work being done elsewhere and that the work must be conducted in co-operation with the International Union against Cancer.

### *Venereal disease in merchant seamen*

Under the Protocol signed at the International Health Conference in New York in 1946 WHO took over the administration of the Brussels Agreement of 1924 respecting facilities to be given to merchant seamen for the treatment of venereal diseases. Following suggestions by the Health Assembly and the Executive Board that this agreement might be revised and broadened the Director General convened a study group in 1956 to consider what steps might be taken. Its report was circulated at the twentieth session of the Board which had decided to consider the matter further at its twenty-first session. The main recommendations of the group were that the Brussels Agreement should not be superseded by international health regulations and should not be abrogated unless similar provision were made in a broader agreement that other nations should be asked to adhere to the agreement that a technical committee of experts in the field of maritime public health and venereal disease control should be convened periodically to advise WHO and that the Director General should consider arrangements for the provision of a scheme giving more comprehensive health services for seafarers in the major ports throughout the world. The Director General had pointed out that before a decision could be taken on the last recommendation an extensive study of the question would have to be made in co-operation with the International Labour Office and this would take some time. The great value of the Brussels Agreement which was the first international agreement of its kind was stressed by speakers in the discussion but it was the general opinion that joint studies

# Notes and News

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## Re-introduction of malaria

The need for measures to prevent the re introduction of malaria into areas where the disease has been eradicated—or where its eradication is under way—is recognized by the WHO Committee on International Quarantine in its fifth report<sup>1</sup> which was discussed by the WHO Executive Board at the latter's twenty first session. In considering this topic the Committee had before it the report of the WHO Study Group on International Protection against Malaria<sup>2</sup> which met in Amsterdam in December 1956 and the sixth report of the WHO Expert Committee on Malaria<sup>3</sup>.

The disease may be re introduced either by infected persons or by insect vectors. Of the latter those which have developed resistance to insecticides present a special danger.

The risk of the re introduction of malaria by infected persons is greatest during or after the final or "maintenance" stage of an eradication campaign when positive measures to prevent the transmission of the disease are no longer being taken and the active surveillance mechanism for the detection of cases has been replaced by the normal vigilance of the public health service. At this stage a careful watch should be kept for primary cases among new arrivals in the area and for secondary cases in their vicinity.

These new arrivals may be divided into the following categories: international travellers including tourists; migrants including seasonal workers or permanent settlers; and such groups as nomads or pilgrims.

International travellers normally arrive singly or in small groups (couples or families) and their stay is usually short. Second

ary cases arising from the re introduction of malaria by persons in this category are likely to be few in number and relatively circumscribed as regards time and place of occurrence. When the disease is re introduced by persons in the other categories—who will generally arrive in greater numbers and in most cases will stay for some time—secondary cases will probably be much more numerous and scattered, spaced out over a longer period and less easy to control.

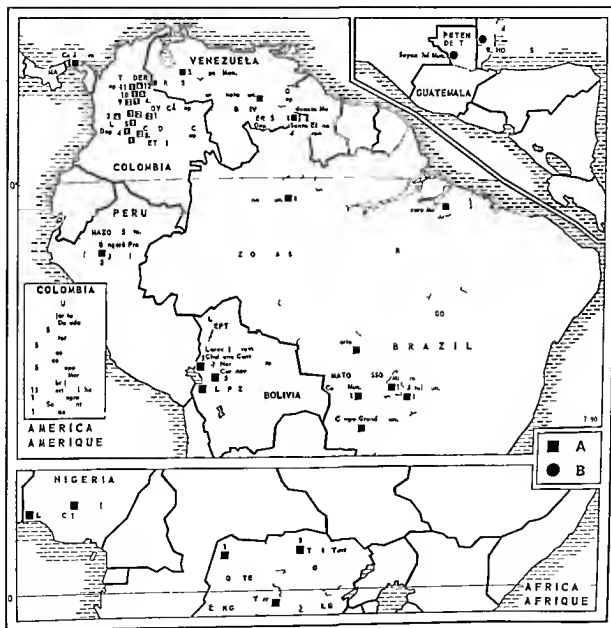
The Committee was of the opinion that there is no need for international travellers to be subjected to special antimalaria measures before entering areas of eradication. On the other hand it might be desirable for antimalaria drugs to be administered to all migrants and participants in "periodic mass congregations" proceeding to such areas. Measures to this effect have already been found necessary in French Guiana. Amendments to the International Sanitary Regulations in this connexion are not however contemplated for the moment nor is there as yet any question of declaring malaria a quarantinable disease.

The development of resistance to insecticides among insect vectors of malaria has been known to cause the temporary failure of control or eradication programmes. The transference of resistant vectors to areas where eradication programmes using the same insecticides are in progress would almost certainly have the same result.

The Committee considered that the strongest defence against the importation of mosquitos by sea or air is the rigid protection of ports of entry by antimosquito measures and endorsed a recommendation by the Study Group on International Protection against Malaria that health administrations concerned "should be asked to take all reasonable possible steps to this end." Disinsectization of aircraft on or before arrival may also be necessary and—in cases where there

Two of the accompanying maps show the distribution of these cases while the third indicates the northward movement of yellow fever in Central America during 1957 as revealed by the presence of the disease in vertebrates other than man in Sayaxché Municipio Peten Department Guatemala and in the Cayo district of British Honduras

# YELLOW FEVER IN 1957



- A = Human cases notified in 1957  
 B = Presence of yellow fever in vertebrates other than man  
 s = Suspected cases

## Improvements in the casting of water-seal latrines

The hand flushed water seal latrine is not only fly proof but—if the bowl and slab are kept clean—odourless. A further advantage is that its design makes it impossible for children and small animals to fall into the latrine pit. An inexpensive method of casting water seal latrine bowls in cement mortar and incorporating them in concrete slabs was first developed on a WHO project in Chiangmai, Thailand and has been described in the WHO Bulletin<sup>1</sup>

Two interesting modifications in this method have been introduced at Trivandrum, India, further reducing costs and permitting a greater use of locally available material.

The first modification is in the moulding of the bowl and trap. Originally a separate clay form was used for the interior of the trap. This has now been replaced by a wooden form, which is attached by a dowel to the main (wooden or concrete) body of the mould during mortaring but can be lifted off with the bowl when the cement has hardened. The shape of the form permits its withdrawal from the finished trap. The whole process of tempering and moulding clay and subsequently digging it out of the trap has thus been eliminated.

The second modification consists of reinforcing the concrete slab with bamboo strips 2.3 cm wide in place of light wire mesh (chicken wire). Preliminary tests suggest that this method of reinforcement—which has reduced latrine construction costs at Trivandrum by about 16%—imparts greater strength to the slab.

## Preservatives in milk

For many years one of the chief problems in the milk industry—especially in warm climates—has been that of keeping milk fresh, particularly while it is awaiting delivery to a pasteurizing or processing plant. The use of rapid transport and refrigeration for this purpose may be costly and cannot provide a practicable solution in every case.

A group of experts convened by the Food and Agriculture Organization of the United Nations (FAO) therefore met at Interlaken, Switzerland from 23 to 27 September 1957 to discuss the possibility of using preservatives, notably hydrogen peroxide, to overcome the problem. WHO was represented at this meeting by Professor H. D. Kay, Director of the National Institute for Research in Dairying, United Kingdom, and Dr I. Nir-Grosfeld of the Health Laboratory Methods Section, WHO Headquarters.

According to the general principles formulated by the Joint FAO/WHO Committee on Food Additives<sup>2</sup> decisions on the use of any form of food additive should be based above all on evidence of its safety.

In the case of hydrogen peroxide, this evidence is not at present sufficient to warrant its use as a preservative in milk. The meeting was generally of the opinion that the use of this or any other preservative in milk is undesirable and should be considered only in exceptional circumstances.

## Expert Committee on Medical Rehabilitation

The problem of physical disability has received much attention in recent years, both from government authorities and voluntary organizations. Today a great deal can be done to restore physically handicapped persons to a comparatively normal life, thanks to new concepts and methods of rehabilitation (medical, social, educational and vocational).

The WHO Expert Committee on Medical Rehabilitation met in Geneva during February to review the basic principles and aims of medical rehabilitation and discuss the planning and organization of medical rehabilitation services with particular reference to the less developed countries.

The following experts took part in the meeting: Dr F. S. Cooksey (United Kingdom), Dr G. Harlem (Norway), Or H. H. Kessler (USA), Dr M. Maurer (Romania), Dr E. Mindus (Sweden), Or F. E. Godoy Moreira (Brazil), Professor J. Parrot (France) and

is reason to expect the importation of insect vectors of disease—this measure could be applied to other modes of transport as well

### Resistance to DDT in *Anopheles stephensi*

*Anopheles stephensi* is an important vector of malaria in several of the Eastern Mediterranean countries and in South East Asia. After spraying with DDT had been carried out successfully against this mosquito for periods up to 10 years resistant strains recently began to emerge. Resistance was first confirmed late in 1955 in the Dhahran area of Saudi Arabia where DDT had been in use since 1947. Suspicion had been aroused the previous year by an increase in the number of house resting *A. stephensi* and by a rise in parasite and spleen rates. Susceptibility tests carried out by Mr G. Davidson, WHO consultant, confirmed that resistance had developed in areas sprayed with DDT but not in an unsprayed area. Susceptibility to dieldrin and to BHC was normal in both treated and untreated areas.

During 1957 strains of *A. stephensi* resistant to DDT made their appearance in Iran and Iraq. In Iran DDT spraying had been in progress for 56 years. The first indication that resistance had developed was an epidemic of malaria affecting between 8000 and 15 000 people in the Abadan area, a part of the country that had been practically free from malaria for the previous three years. Another outbreak occurred in the Shadegan area. Susceptibility tests showed that resistance to DDT in *A. stephensi* extended to nearly all the area of distribution of this species in Iran. The population affected is approximately 1 300 000. The Iranian Government in consultation with WHO has decided to replace DDT by dieldrin in the next spraying operations throughout the entire area of distribution of *A. stephensi*.

A study carried out by a WHO Advisory Team on Malaria Eradication in southern Iraq showed that DDT resistance in *A. stephensi* had also developed in Basra (near the Abadan area of Iran) and in the neighbour-

hood of Nassriya. In Basra DDT larvicide had been in use since about 1947 and DDT imagocide since 1954 but in the Nassriya area DDT spraying had been carried out for the first time in April 1957 against adults only. The fact that resistance was found in both adults and larvae in this area is therefore a rather alarming development. As in Iran susceptibility to dieldrin and BHC was normal and the Iraq Government has decided to replace DDT by dieldrin in all malarious areas where *A. stephensi* is the vector. There is a population of about one million living in the affected areas.

Preliminary accounts of the observations on DDT resistance in *A. stephensi* made in Iran and Iraq were presented at the last WHO Regional Technical Meeting on Malaria Eradication held in Baghdad from 7 to 12 December 1957 and will shortly be published in the WHO Bulletin.

### Dieldrin resistance in *Culex pipiens fatigans* in Malaya

Resistance to insecticides in *Culex pipiens fatigans* has already been reported from two areas in Malaya. In Penang two years use of BHC as a larvicide resulted in the development of a strain which was found to have acquired a tenfold resistance to BHC and also to dieldrin to which it had not been exposed. In Singapore when larval control became unsatisfactory after 6 months use of a dieldrin emulsion laboratory experiments confirmed that active resistance to dieldrin had developed. The latest observations as reported by R. H. Wharton in an article on the resistance of *Culex pipiens fatigans* which will shortly appear in the WHO Bulletin deal with the finding of two further dieldrin BHC resistant strains of *C. p. fatigans* in Malaya but differ from the previous reports in that resistance in one strain at least was developed as a result of house spraying with dieldrin against adult mosquitoes. In this strain resistance to dieldrin was about 100 times greater than normal in both adults and larvae and resistance to gamma BHC in larvae about 20 times greater while resistance to DDT was slight.

health workers and nutritionists which are the outcome of work done in collaboration with WHO

The first of these publications *Principles of Milk Legislation and Control* by W. A. Lethem (Agricultural Development Paper No. 59) is the result of the common interest of FAO, UNICEF and WHO in the field of milk hygiene. It has been produced through the efforts of the Inter Agency (FAO/UNICEF/WHO) Working Group on Milk Products which was set up to study problems of increasing milk production and consumption keeping in mind the necessity of ensuring that the product is nutritious, wholesome and not a danger to public health. This publication aims at outlining the legislation and control which may have to be introduced in order to ensure that milk and milk products as they reach the consumer are clean, wholesome and safe.

**Contents:** Administration. Special provisions for hot climates. General requirements. Special requirements during conveyance and distribution. Special types of milk. Milk products. Tests. Conclusions.

The author, a barrister at law and consultant to FAO, was lately Principal Medical Officer, Ministries of Health and Food, United Kingdom. The price of this 68 page

brochure is 3/9 or US \$0.75. French and Spanish editions are also available.

The second publication *Report of an International Seminar on Education in Health and Nutrition* by F. W. Clements (Nutrition Meetings Report No. 13) deals with a seminar held by FAO and WHO at Baguio, Philippines in 1955 with 58 participants from 22 nations. In the words of the author, this report "attempts to record progressively the thinking and the reactions of a group of people brought together for a period of time to discuss common problems in the field of health and nutrition education". Divided into three parts, the report briefly tells the story of the seminar itself in Part I. Part II deals with detailed reports of the topics discussed and Part III consists of appendices.

**Contents:** Main points emerging from the seminar. What the seminar meant to participants. How the staff saw the seminar. Learning about themselves and their problems. Learning about people. Learning and teaching. How to develop health and nutrition education programmes. Evaluation. Follow up.

The price of this 92 page booklet which is published in French as well as English is 5/- or US \$1.00.

## People and Places

**Leprosy: its transmission and epidemiology**

A well known French leprologist, Dr. Paul Lethem, recently went to train, on behalf of WHO, to assist the French Government in launching a new leprosy control project. Dr. Lethem will also visit the WHO/UNICEF-assisted leprosy control project in Ethiopia.

Dr. Lethem has worked as a leprologist in the French territories of Oceania and West and Equatorial Africa for more than twenty years and is a member of the WHO Expert Advisory Panel on Leprosy. His work develops the detectable suspicion of DDS (diagnostic dermatitis) in chaulmoogric media has greatly facilitated the mass treatment of the disease.

**Trillion study in Northern Rhodesia**

In connection with a general scheme for rural development, the Government of Northern Rhodesia

is conducting research into the relationship between diet and parasitic diseases and the effect on health. To assist in this task, WHO has sent a medical nutritionist—Dr. Bent Fri Hansen of Denmark—to Northern Rhodesia for a period of one year. Another WHO consultant, Dr. Fergus S. McCullough, has already carried out a survey of parasitic diseases in the area.

A graduate of the University of Copenhagen, Dr. Fri Hansen has studied metabolism at the Harvard Medical School and also a special interest in paediatrics.

**WHO team for tuberculosis project in Kenya**

A five member team has been formed by WHO to assist the Government of Kenya in research on the use of chemotherapy and chemoprophylaxis in tuberculosis control. The team, which is expected to arrive in Kenya in April, will first carry out a survey of the prevalence of tuberculosis in Nairobi where a



Dr R Socharso (Indonesia) Representatives from the United Nations and ILO also took part in the meeting

### Sanitation of international airports

In 1951 the Fourth World Health Assembly reviewing general public health problems arising from air travel stressed the need for protecting the health of aircrews on international flights. It advocated the control at international airports not only of the quarantinable diseases covered by the International Sanitary Regulations but also of such diseases as dysentery food poisoning gastro enteritis and malaria. The Assembly recommended that WHO set up a Committee in collaboration with the International Civil Aviation Organization (ICAO) to prepare a guide for use by health administrations in the sanitary control of international airports.

As a first step in this direction WHO drafted a document on the hygiene and sanitation of air travel. This document was discussed with ICAO and circulated for comment to experts in a number of countries. A new draft prepared on the basis of the comments received was one of the main subjects of discussion at a meeting of the WHO Expert Committee on Sanitation of International Airports held in Geneva during March.

The purpose of the meeting was to review the special sanitation problems associated with air travel to study the relationship of airport sanitation to the general public health programmes of airports and to recommend appropriate administrative and technical measures.

The following experts took part: Mr S Haegerstrom (Sweden) Professor A El Halawani (Egypt) Mr Malcolm C Hope (USA) M R Maurel (France) Dr Edgar Tostes (Brazil) and Sir Harold Whittingham (United Kingdom). The meeting was attended by two observers from ICAO.

### Dental health services for children

Regular dental examinations early treatment of caries and preventive measures—brushing suitable diet and the use of

fluorides—are necessary for the protection of the teeth. Such protection must obviously begin in childhood and it is therefore important that there should be good dental services in schools and for children generally.

As neglect of the teeth is a widespread cause of ill health in Europe a Study Group on Dental Health Services for Children sponsored by the Belgian Government and the WHO Regional Office for Europe was convened at Brussels in February. The purpose of the meeting was to study existing dental health services for children in Europe and to make suggestions for their improvement and the development of new services.

The Study Group included participants from Belgium Bulgaria Denmark Finland France Germany Ireland Italy Netherlands Norway Sweden Switzerland the United Kingdom USSR and Yugoslavia.

### Seminar on the resistance of insects to insecticides

Increasing insecticide resistance is becoming a serious threat to the success of vector control and eradication programmes. A seminar on this urgent problem was therefore convened by WHO from 26 February to 7 March at New Delhi on the invitation of the Government of India. Its aim was to encourage and develop research on insecticide resistance by enabling biologists and entomologists working in this field to pool their knowledge and techniques and evolve some form of corporate attack on the problem.

The seminar had 54 participants from the following countries and territories in the Western Pacific South East Asia and Eastern Mediterranean Regions: Australia Egypt Hong Kong India Iran Israel Japan Lebanon Malaya New Zealand Pakistan Philippines Saudi Arabia and Taiwan (China).

### Nutrition publications

The Food and Agriculture Organization of the United Nations (FAO) has recently issued two publications of interest to public

responsible for the mophophylaxis among the French troops. He has more recently held public health appointments in French West Africa and Laos.

Dr Houel has worked in Morocco as Chief of the Malaria Service in charge of general prophylaxis and epidemiology and also as Chief of the Preventive Section of the Ministry of Health. In the latter capacity he directed BCG antrachoma and antisyphilis campaigns in collaboration with WHO and UNICEF.

#### Other staff changes at WHO Headquarters

Dr Constantin Vinokourov of Moscow has been appointed Director of the Division of Therapeutic Substances at WHO Headquarters Geneva. He succeeds Dr W. A. Timmerman who was recently appointed Assistant Director-General in charge of the Department of Central Technical Services.

Educated at the University of Moscow, Dr Vinokourov has been associated with the development of WHO in the early days of the Organization, serving as the adviser of the USSR delegation to the fifth session of the WHO Interim Commission and the First World Health Assembly. A representative of the USSR Academy of Medical Sciences, he has taken part in numerous international conferences in Iran, Germany, Italy, Denmark, Switzerland, Poland, France and Albania. Prior to his appointment with WHO, Dr Vinokourov was Department Chief at the Neuro-

logical Institute of the USSR Academy of Medical Sciences.

Dr R. Lowry Dobson, from the University of California, Berkeley, California, USA, has been appointed to Headquarters to assist in WHO's programme concerning the peaceful uses of atomic energy in relation to health. A graduate of the University of California, Dr Dobson received his A.B. his M.D. and later his Ph.D. in Biophysics from this University. Since 1947 he has been Medical Director of the Health Protection Group in the University of California Radiation Laboratory and has had considerable teaching and research experience in the University. He has also been engaged in work connected with the clinical uses of radioisotopes. Most of Dr Dobson's published work is concerned with various aspects of the biological effects of radiation.

Dr Edward Grzegorzewski has been granted special leave of absence from his post as Director, Division of Education and Training Services, WHO Headquarters, so that he may take up appointments in the USA and Puerto Rico. The first of these appointments is as Visiting Professor of Public Health for the year 1957/58 at Johns Hopkins University, Baltimore, Md., and the second as Professor of Preventive Medicine and Public Health and Director of the corresponding Department, at the University of Puerto Rico, San Juan.

## Review of WHO Publications

### BILHARZIASIS

*Intermediate hosts of Schistosoma African Biomphalaria and Bulinus* by G. Mandahl Barth. Geneva, 1958 (*World Health Organization Monograph Series* No. 37) 132 pages. Price £1 \$4.00 or Sw fr 12.— French edition in preparation.

The nomenclature of the snails which serve as intermediate hosts for bilharziasis, particularly those species belonging to the genera *Biomphalaria* and *Bulinus* in Africa, has been in a state of confusion for many years. A number of factors have been res-

ponsible for this. The original description of a species for example was often so brief and generalized that it is not now possible to be certain what species was being described. Frequently the exact locality where the type material was found is not known, thus preventing the collection of topotype material from which a fuller description of the species, particularly the anatomy, could be made. Since it was a common practice among certain authors to name indiscriminately the extremes found within the normal range of variation in a single species the

random sample of the population will be examined. Cases will be treated at home and an attempt will be made to find the most efficient way of administering chemotherapy on a large scale in an African population.

The leader of the team is Dr Tage Egemose of Denmark who has studied anti tuberculosis work in the United States and has taken part in internationally assisted BCG campaigns in Europe and South America. Dr E Mossige of Norway the bacteriologist on the team participated in a number of WHO assisted projects in the South East Asia and Eastern Mediterranean Regions during the past seven years. The statistician Mr Jon Thillemann of Denmark has been with WHO for several years working for most of the time at the Tuberculosis Research Office in Copenhagen. Miss Fay Ashton the team's public health nurse is British and has worked for more than four years on a WHO assisted tuberculosis project in Pakistan. The laboratory technician Mr Alfred Beer who is also British has worked in various laboratories in the United Kingdom.

#### Organization of mental health service in Iran

WHO has appointed Dr Geoffrey Tooth as Mental Health Adviser to the Government of Iran for a period of two months starting in February. His duties will include advising the Government on the organization of a mental health service—both preventive and curative—within the framework of the public health services; advising the Ministry of Education on juvenile delinquency problems and the development of child guidance clinics and helping to organize psychiatric training for medical personnel and mental health workers in general.

Dr Tooth is a Commissioner of the Board of Control Ministry of Health London where his work involves the inspection of psychiatric and mental deficiency institutions. He has carried out research on mental health problems in Ghana and Nigeria and in 1956 acted as consultant to the WHO Expert Committee on Mental Health.

#### Health education adviser for India

A WHO health education adviser—Dr Hartmut Dix—went to Nagpur India in February to assist in planning and developing health education services in Central Province. Dr Dix who has a degree in public health from the University of California was Director of Health Education in the Ministry of Health for Germany.

#### Re drafting of public health legislation

The Government of Ceylon plans to bring its public health legislation more into line with modern

requirements. Dr Frederick Grundy Professor of Preventive Medicine in the Welsh National School of Medicine Cardiff has gone to Ceylon, on behalf of WHO to advise the Government in this connexion. Professor Grundy who is a barrister at law held many executive posts in public health before taking up an academic career. His published work includes the WHO monograph *Teaching of Hygiene and Public Health in Europe* which he wrote in collaboration with Professor James Mackintosh.

Professor Grundy will be joined later by Mr E. H. Watson Senior Legal Assistant of the Ministry of Health London. Mr Watson has twenty five years experience of the legal and administrative aspects of public health legislation. He will be responsible for the preparation of such new and amended legislation as may be found necessary for presentation to the legislature of Ceylon.

#### Training of malarialogists

Dr Alan Gilroy went to Iraq in February on behalf of WHO to give a training course to future malarialogists. Educated at the University of Melbourne and the London School of Hygiene and Tropical Medicine Dr Gilroy has been associated for some twenty years with malaria and its control in various countries including New Guinea Nigeria Ghana and India.

#### Pool of advisers on malaria eradication

A pool of advisers has been created in the Division of Malaria Eradication WHO Headquarters to assist countries in planning eradication campaigns and provide them with technical advice when the campaigns are in progress. The members of this pool are Dr Perez Yekutieli Dr Jean Lavergne and Dr G Houel.

After a month's general briefing at WHO Headquarters the three malarialogists will spend some two months in Latin America visiting eradication campaigns in Mexico Venezuela and other countries. They will then return to Geneva where they will be available for assignment—as leaders of pre-eradication survey teams or of advisory groups—to countries requesting advice.

Dr Yekutieli has been Director of the Division of Epidemiology in the Ministry of Health Israel for the last six years. He has carried out malaria surveys and control work in several countries of the Eastern Mediterranean Region.

Dr Lavergne is a former Medical Adviser to the French Army and has worked on parasitology in Cameroun and Viet Nam. From 1947 to 1949 he was Director of the Malaria Services in Madagascar where he carried out several field operations and was

elapsed since this publication appeared a considerable amount of further information on the goitre problem has come to light and it was felt that it would be useful to publish a second collection of papers. It is hoped that this second collection which is now published in the Bulletin will eventually be revised and re issued together with some additional material to make the treatment of the subject as comprehensive as possible in monograph form. Since the monograph will be published in separate English and French editions the summaries in the other language that are usually included at the end of articles in the Bulletin have not been provided in this issue.

After Kelly & Snedden's world survey of endemic goitre follows a contribution by F W Clements who discusses the natural history of the disease in affected persons and reviews the present state of knowledge regarding the occurrence of cretinism, deaf mutism and mental deficiency in the offspring of goitrous parents—a subject that is still to a large extent a matter for controversy.

"Insight into the nature of thyroid disease" writes J B Stanbury in the next article the third in this series of papers has developed through an understanding of the normal function of the thyroid gland. In his article Stanbury gives a brief outline of what is currently known of the physiology of the thyroid and of the metabolic circuit of iodine and summarizes the information available regarding the functional abnormalities of the human thyroid when it is deprived of iodine.

The results of goitre surveys carried out in various parts of the world will not be strictly comparable unless uniform techniques are employed. C Perez, N S Scrimshaw & J A Munoz, discussing the classification of goitre and the technique of goitre surveys in the fourth article stress the importance of adopting methods that will result in data which can be used with confidence to guide public health programmes. This interesting contribution outlines procedures for selection of population samples, examination, classification of goitres and tabulation

and presentation of survey data etc that have "proved practical and useful under a wide variety of conditions".

The next article deals with the important question of the treatment and prevention of endemic goitre. J Matovinović & V Ramalingaswami trace the history of goitre therapy and prophylaxis from their earliest days up to the present pointing out the mistakes that were made in the past and the developments that have taken place in recent years. They draw attention to some recent work by Clements that may prove to be of importance in some areas. There is it appears in Tasmania a naturally occurring goitrogenic substance which seems to have the capacity to inhibit the iodine trapping mechanism of the thyroid and in these circumstances treatment with iodine may be of no avail. It is quite clear however that where goitre is demonstrated to be due to an iodine deficiency its control should be a simple matter and the authors conclude their paper with the much quoted opinion of David Marine a pioneer of modern goitre prophylaxis. "Simple goitre is the easiest of all known diseases to prevent. It may be excluded from the list of human diseases as soon as society determines to make the effort".

The control of endemic goitre is usually merely a matter of making good the iodine deficiency of the affected population. In practice however the provision of supplementary iodine presents certain technical problems. Salt the most widely used vehicle for the iodine varies in quality from the fine free running product available in highly developed countries to the coarse substance common in less developed areas and different techniques for iodization are therefore required. In the last paper in this series J C M Holman describes various iodization processes including some simple and inexpensive ones specially designed for use in regions where the people are accustomed to using local supplies of crude salt and deals with other technical matters such as the stability of iodized salt, the most suitable levels of iodization and the determination of iodine in common and iodized salt.

snails are known under a variety of names. Unfortunately moreover there have been too few malacologists competent to determine correctly the species belonging to these two genera.

During the past few years WHO has attempted to improve this situation. On two occasions specialists in malacology from several countries have been assembled to discuss the taxonomic problems in the hope that agreement could be reached which would unify the nomenclature used in the determination of this group of snails. Snail Identification Centres have been established at Copenhagen, Paris and Salisbury to which collections could be forwarded for identification and where students might study and compare well preserved material from various parts of Africa and come to a better understanding of the range of variation to be found among these snails.

This monograph—the first comprehensive study from one of these Centres—is based on the examination of a large number of specimens from many localities which have been compared with the original descriptions and whenever possible with type material. The conclusions it presents have been critically reviewed by several malacologists who also have had considerable experience with these two genera. They encountered some difficulty in attempting to appraise this work accurately however because of the disparity of the material which each one had studied; these was also disagreement with some of its conclusions owing to differences of opinion on the concepts of species, subspecies and ecophenotype. Only additional research on specimens collected from the localities which provided the material studied in this work and the collection and examination of further material from areas where little or nothing is known regarding the species, subspecies and variations will make it possible to establish a recognized and stable nomenclature. There was unanimous agreement among the scientists however that Dr Mandahl Barth's comprehensive study would serve as an invaluable basis for more advanced research and a better understanding of the species of these African snails.

## ENDEMIC GOITRE

*Bulletin of the World Health Organization*,  
1958 Volume 18 Number 12 (pages  
1 274)

"Goitre occurs with varying intensity in almost every country; few countries appear to be entirely free from it. The disease has been observed in the far north in the tropics and in the far south; it occurs quite independently of climate, season or weather. Moreover in its incidence goitre makes no distinction of race, nationality, colour, creed or class: the North American, the European, the Chinese, the Himalayan Indian, the Turkoman and the peoples of Central and South America all suffer from it under certain conditions—some severely, some moderately, some but mildly.

The above are the opening words of the first article in this issue of the *Bulletin of the World Health Organization*<sup>1</sup>—a world survey by F. C. Kelly & W. W. Snedden of the prevalence and geographical distribution of endemic goitre—and they emphasize the global nature of the goitre problem today. Endemic goitre is not a "killer" like malaria or cholera, but it nevertheless has serious repercussions on the physical, social and economic well-being of any population in which it is rife. Through its direct effects on afflicted persons—discomfort, disfigurement and apathy—and its indirect consequences—increased incidence of certain grave pathological conditions—it is responsible for much human misery and suffering.

In 1952 recognizing the public health significance of the disease, the World Health Organization convened a group of experts to study the matter. The report of this study group, as well as a number of individual papers dealing with various aspects of the control of endemic goitre, was subsequently published in the *Bulletin* (Vol. 9 No. 2) in the hope that the information would be of assistance to governments interested in investigating the goitre position in their own territories. In the four years that have

elapsed since this publication appeared a considerable amount of further information on the goitre problem has come to light and it was felt that it would be useful to publish a second collection of papers. It is hoped that this second collection which is now published in the Bulletin will eventually be revised and reissued, together with some additional material to make the treatment of the subject as comprehensive as possible in monograph form. Since the monograph will be published in separate English and French editions the summaries in the other language that are usually included at the end of articles in the Bulletin have not been provided in this issue.

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# International Non-Proprietary Names for Pharmaceutical Preparations

In accordance with paragraph 3 of the Procedure for the Selection of Recommended International Non-Proprietary Names for Pharmaceutical Preparations (see Annex 1 page 109) notice is hereby given that the following names are under consideration by the World Health Organization as Proposed International Non-Proprietary Names

Comments on or formal objections to Proposed Names may be forwarded by any person to the Pharmaceutical Section of the World Health Organization within four months from 1 April 1958

The inclusion of a name in this list does not imply any recommendation for the use of the substance in medicine or pharmacy

## PROPOSED INTERNATIONAL NON-PROPRIETARY NAMES (Prop INN) List 6<sup>1</sup>

P p d i t t u l  
N P p l t t y N m  
(Lat Engl h)

Chemical Name Dose

acenocoumarolum	3 [ (4 nitrophenyl) $\beta$ acetyl ethyl]-4 hydroxycoumarin
acenocoumarol	
acepromazinum	2 acetyl 10-(3 dimethylaminopropyl) phenothiazine
acepromazine	
acetazolamidum	2 acetamido 1,3,4 thiadiazole 5 sulfonamide
acetazolamide	
acidum edeticum	ethylenediamino N N N N tetra acetic acid
edetic acid	
aldosteronum	18 oxo-corticosterone
aldosterone	
ambenonii chloridum	N N bis-(2 diethylaminoethyl)-oxamide bis 2-chlorobenzyl chloride
ambenonium chloride	
ambucarinum	$\beta$ diethylaminocetyl 4 amino 2 butoxybenzoate
ambucaine	
ambucetamidum	2 (di n butylamino) 2-(p-methoxyphenyl) acetamide
ambucetamide	
aminometradinum	1 allyl 3-ethyl 6 amino 2,4 dioxo-1,2,3,4-tetrahydropyrimidine
aminometradine	
amiphenazolum	2,5 diamino-4 phenylthiazole
amiphenazole	

am ometrad num misometrad ne	6-amino-1,2,3,4-tetrahydro-3-methyl-1-methylallylpyrimidine-2,4-dione
amola onum amolano	3-( $\beta$ -diethylaminoethyl)-3-phenyl benzofuran-2-one
azacyclonol m azacyclonol	-di-phenyl- $\alpha$ -piperid-4-yl methanol
bemegridum bemegrade	4-ethyl-4-methyl-2,6-dioxo-piperidine
benactylzinum benactyzine	2-diethylaminoethylbenzilate
benzonatatum benzoate	2-( $\omega$ -methoxyoctaethyleneoxy)-ethyl <i>p</i> -butylaminobenzoate
betazolium betazol	3-( $\beta$ -aminoethyl)-pyrazole
betameterin m betameterine	2-diethylaminoethyl-4-phenyl- $\alpha$ -piperidinoacetate
butylum butyl n	1,4-dimethanesulfonobutane
calcium coheptonas calcium coheptonate	calcium hexahydroxyheptonate
captozum captozime	<i>p</i> -butylthiodiphenylmethyl-2-diethylaminoethyl sulfide
carbazochromi salicylas carbazochrome salicylate	drenochrome monosemicarbazone sodium salicylate complex
chlorambucium chlorambucil	<i>p</i> -di-(2-chloroethyl)-aminoethylbutyric acid
chlormonium chlormorine	4-{ $\gamma$ -(4-morpholino)- <i>p</i> -oxy}-3-chlorobenzyl
chlorheudin m chlorhexid	1,6-bis-( <i>p</i> -chlorophenyl)diguanido-hexane
chlorisondam chloridum chlorisondamne chloride	4,5,6,7-tetrachloro-2-(trimethylammonium-ethyl) $\Delta$ -methyl isodolene dihydride
chlorthalid m chlorthalid	$\beta$ -diethylaminoethyl-2-chloro-4-aminobenzoate
chlorotrianisenum chlorotrianene	tri-( <i>p</i> -methoxyphenyl)-chloroethylene
chlorylum chloryl	4-chloro-3,5-dimethylphenol
cinnafurad m cinnafuradone	4-tetrahydrofurfuryl 1,4-(benzo(c)-cinnolino)-pyrazole-3,5-dione
clidinium bromid m clidinium bromide	1-methyl-3-benzoyloxyquinuclidine-9-methyl bromide
corticotrophin m corticotrophin zinc hydroxide	preparation of purified corticotrophin adsorbed on zinc hydroxide
crotamtonum crotamton	$\Delta$ -ethyl- $\Delta$ -toluylcrotamton



cryofluorane	1,2-dichloro-1,1,2,2-tetrafluoroethane
cryofluorane	
cyclomethycainum	3-(2-methylpiperidino) propyl <i>p</i> -cyclohexyloxybenzoate
cyclomethycaine	
cycloserinum	4-amino-isoxazolidin-3-one
cycloserine	
demecolcinum	deacetylmethylcolchicine
demecolcine	
deserpidinum	11-desmethoxyreserpine
deserpidine	
dextromoramide	<i>d</i> -3-methyl-2,2-diphenyl-4-morpholinobutylpyrrolidine
dextromoramide	
dichlorophenum	di-(5-chloro-2-hydroxyphenyl) methane
dichlorophen	
dicycloverinum	<i>β</i> -diethylaminocethyl cyclohexyl cyclohexane-carboxylate
dicycloverine	
dimethoxanatum	<i>β</i> -dimethylaminoethoxyethyl phenothiazine-10-carboxylate
dimethoxanate	
dioxethedrinum	1-(3,4-dihydroxyphenyl)-2-ethylamino propan-1-ol
dioxethedrin	
diphenadionum	2-diphenylacetyl-1,3-indandione
diphenadione	
diphenylpyralinum	<i>N</i> -methylpiperidyl-4-benzhydryl ether
diphenylpyraline	
dipyrrocetylum	2,3-diacetoxybenzoic acid
dipyrrocetyl	
dycloninum	<i>p</i> -butoxy-3-piperidinopropiophenone
dyclonine	
ecothiopat iodium	<i>o,o</i> -diethyl <i>s</i> -(2-trimethylammonium ethyl) phosphorothiolate iodide
ecothiopat iodide	
endomycinum	an antibiotic substance obtained from cultures of <i>Streptomyces endus</i>
endomycin	or the same substance produced by any other means
etamiphyllinum	7-(2-diethylaminoethyl) theophyllin
etamiphyllin	
ethinamatum	1-ethynylcyclohexyl carbamate
ethinamate	
ethotoinum	3-ethyl-5-phenylhydantoin
ethotoin	
ethylphenacemidum	phenylethylacetylurea
ethylphenacemide	
ethypiconum	4,6-dioxo-3-methyl-5,5-diethyl-1,4,5,6-tetrahydropyridine
ethypicone	
etoxeridinum	1-[2-(2-hydroxyethoxy)-ethyl]-4-phenylpiperidine-4-carboxylic acid
etoxeridine	ethyl ester
florantyroneum	<i>γ</i> -fluoranthene-8-yl <i>γ</i> -oxobutyric acid
florantyrone	

fludrocortisoni acetate  
fludrocortisone acetate

fluoxymesteronum  
fluoxymesterone

formintraazolum  
formintraazole

glucrolactonum  
glucrolactone

glutithim dum  
glutithimide

halothanum  
halothane

hexidinum  
hexidine

hexocylmethylsulfas  
hexocylmethylsulfate

histapyrrolium  
histapyrrolide

homarylmum  
homarylamine

hydrocortamati hydrochloridum  
hydrocortamate hydrochloride

hydroxyzinum  
hydroxyzine

injectio insulini zinci globinati  
globin zinc insulin injection

injectio nolini zinci protaminati  
protamine zinc insulin injection

isomethepentenum  
isomethepentene

isothipendylium  
isothipendyl

lauralkochloridum  
lauralkochloride

leucorinum  
leucorin

levomoramidum  
levoramide

liothyronum  
liothyronine

magnesiolum glycinate  
magnesium glycinate

mecamylaminum  
mecamylamine

mephenterminum  
mephentermine

9- $\alpha$ -fluoro-17-hydroxycorticosterone 21-acetate

9- $\alpha$ -fluoro-11 $\beta$ -17 $\beta$ -dihydroxy-17- $\alpha$ -methylandrosta-4-ene-3-one

2-formamido-5-nitrothiazole

$\gamma$ -lactone of D-glucofuranuronic acid

3-ethyl-3-phenyl-2,6-dioxo-piperidine

2-bromo-2-chloro-1,1,1-trifluoroethane

base 1-(3-( $\beta$ -ethylthetyl)-5-methyl-5-amino-hexahydropyrimidine)

N-(3-cyclohexyl- $\beta$ -hydroxy- $\beta$ -phenylethyl)-N-dimethylpiperazine methylsulfate

N-pyrrolidylethyl-N-phenylbenzylamine

N-methyl-5-aminoethyl-1,2-methylenedioxybenzene

17-hydroxycorticosterone 21-diethylaminoacetate hydrochloride

1-(p-chlorobenzhydryl)-4-[(2-hydroxyethoxy)-ethyl]piperazine

a sterile buffered suspension of insulin with zinc chloride and globin

a sterile buffered suspension of insulin with zinc chloride and protamine

2-methylamino-6-methylhept-5-ene

10-(2-dimethylamino-methylethyl)-1-azaphenothiazine

p-laurylphenyloxyethylbenzyl-dimethylammonium chloride

5-formyl-5,6,7,8-tetrahydropteroyl-glutamic acid

1-(3-methyl-2,2-diphenyl-4-morpholinobutyl)pyrrolidine

1-(4-(4-hydroxy-3-iodophenoxy)-3,5-diiodophenyl)alanine

hydroxylmagnesium amino-acetate

3-methylamino- $\alpha$ -camphane

N- $\alpha$ - $\alpha$ -trimethyl- $\beta$ -phenylethylamine

cryofluoranium	1 2 dichloro-1 1 2 2 tetrafluoroethane
cryofluorane	
cyclomethycamum	3-(2 methylpiperidino) propyl <i>p</i> -cyclohexyloxybenzoate
cyclomethycaine	
cycloserinum	4 amino isoxazolidin 3 one
cycloserine	
demecolcinum	deacetylmethylcolchicine
demecolcine	
deserpudinum	11-desmethoxyreserpine
deserpidine	
dextromoramidum	d 3 methyl 2 2 diphenyl-4 morpholinobutylpyrrolidine
dextromoramide	
dichlorophenum	di (5-chloro 2 hydroxyphenyl) methane
dichlorophen	
dicycloverinum	$\beta$ diethylaminoethyl cyclohexyl cyclo hexane-carboxylate
dicycloverine	
dimethoxanatum	$\beta$ -dimethylaminoethoxyethyl phenothiazine 10-carboxylate
dimethoxanate	
dioxethedrinum	1-(3 4 dihydroxyphenyl) 2-ethylamino propan 1-ol
dioxethedrin	
diphenadionum	2 diphenylacetyl 1 3 indandione
diphenadione	
diphenylpyralinum	N methylpiperidyl-4-benzhydryl ether
diphenylpyraline	
dipyroccetylum	2 3 diacetoxybenzoic acid
dipyroccetyl	
dycloninum	<i>p</i> -butoxy 3 piperidinopropiophenone
dyclonine	
ecothiopati todidum	<i>o o</i> diethyl s (2 trimethylammonium ethyl) phosphorothiolate iodide
ecothiopate iodide	
endomycinum	an antibiotic substance obtained from cultures of <i>Streptomyces endus</i>
endomycin	or the same substance produced by any other means
etamiphylinum	7 (2 diethylaminoethyl) theophyllin
etamiphylin	
ethinamatum	1-ethynylcyclohexyl carbamate
ethinamate	
ethotoinum	3-ethyl 5 phenylhydantoin
ethotoin	
ethylphenacemidum	phenylethylacetylurac
ethylphenacemide	
ethypiconum	4 6-dioxo 3 methyl 5 5-diethyl 1 4 5 6-tetrahydropyridine
ethypicone	
etoxeridinum	1-[2 (2 hydroxyethoxy)-ethyl]-4 phenylpiperidine-4-carboxylic acid
etoxeridine	ethyl ester
florantyrinum	$\gamma$ fluoranthene 8 yl $\gamma$ -oxobutyric acid
florantyrone	

fludrocortisoni acetat  
fludrocortisone acetate

fluoxymesteronium  
fluoxymesterone

forminotrazolum  
forminotrazole

glucuro lactonum  
glucuro lactone

glutethimudum  
glutethimide

halothanum  
halothane

hexetidinum  
hexetidine

hexocyclomethylsulfat  
hexocyclomethylsulfate

histapyrrolidinum  
histapyrrolide

homarylaminum  
homarylamine

hydrocortimat hydrochloridum  
hydrocortimate hydrochloride

hydroxyzinum  
hydroxyzine

injectio insulini zinci globinati  
globulin zinc insulin injection  
injectio insulini zinci protaminati  
protamine zinc insulin injection

isometheptenum  
isometheptene

isothendylum  
isothendyl

lauralkonium chloridum  
lauralkonium chloride

leucorinum  
leucorin

levomoramidum  
levomoramide

lithyronum  
lithyron

magnesiumlithionis glycinas  
magnesiumlithionine glycinate

mecamylminum  
mecamylamine

mephenterminum  
mephentermine

9-fluoro-17-hydroxycorticosterone 21-acetate

9- $\alpha$ -fluoro-11 $\beta$ -17 $\beta$ -dihydroxy-17- $\alpha$ -methylandrosta-4-ene-3-one

2-formamido-5-nitrothiazole

$\gamma$ -lactone of D-glucosaronic acid

3-ethyl-3-phenyl-2,6-dioxyperidine

2-bromo-2-chloro-1,1,1-trifluoroethane

6-(1,3-( $\beta$ -ethylhexyl)-5-methyl-5-aminohexahydropyrimidin-2-yl)-

1-( $\beta$ -cyclohexyl- $\beta$ -hydroxy- $\beta$ -phenylethyl)-N,N-dimethylpiperazinum  
methylsulfat

1-pyrroldiethyl-N-phenylbenzylamine

1-methyl-5-aminoethyl-1,4-methylenedioxybenzene

17-hydroxycorticosterone 1-diethylaminoacetate hydrochloride

1-(p-chlorobenzhydryl)-4-(4-hydroxyethoxy)ethylpiperazine

a sterile buffered suspension of insulin with zinc chloride and globulin

a sterile buffered suspension of insulin with zinc chloride and protamine

2-methylamino-6-methylhept-5-ene

10-(N,N-dimethylamino-2-methylethyl)-1-azaphosphorinane

p-laurylphenyloxyethylbenzyl-D-methylammonium chloride

5-formyl-5,6,7,8-tetrahydropteroylglutamic acid

1-(3-methyl-2,2-diphenyl-4-morpholinobutyl)pyrrolidine

1-(4-(4-hydroxy-3-iodophenoxy)-3,5-diiodophenyl)alanine

hydroxyaluminummagnesiumaminoacetate

3-methylamino- $\alpha$ -camphane

1-( $\alpha$ - $\alpha$ -trimethyl- $\beta$ -phenylethyl)amine

cryofluoranium	1 2 dichloro-1 1 2 2 tetrafluoroethane
cryofluorane	
cyclomethycainum	3 (2 methylpiperidino) propyl p cyclohexyloxybenzoate
cyclomethycaine	
cycloserinum	4 amino isoxazolidin 3 one
cycloserine	
demecolcinum	deacetyl methylcolchicine
demecolcine	
deserpidinum	11 desmethoxyreserpine
deserpidine	
dextromoramidum	d 3 methyl 2 2-diphenyl-4-morpholinobutyrylpyrrolidine
dextromoramide	
dichlorophenum	di (5-chloro 2 hydroxyphenyl) methane
dichlorophen	
dicycloverinum	$\beta$ -diethylaminoethyl cyclohexyl cyclo hexane-carboxylate
dicycloverine	
dimethoxanatum	$\beta$ dimethylaminoethoxyethyl phenothiazine 10-carboxylate
dimethoxanate	
dioxethedrinum	1 (3 4 dihydroxyphenyl) 2-ethylamino-propan 1-ol
dioxethedrin	
diphenadionum	2 diphenylacetyl 1 3 indandione
diphenadione	
diphenylpyralinum	N methylpiperidyl-4 benzhydryl ether
diphenylpyraline	
dipyrrocetylum	2 3 diacetoxybenzoic acid
dipyrrocetyl	
dycloninum	p-butoxy 3 piperidinopropiophenone
dyclonine	
ecothiopati iodium	o o-diethyl s (2 trimethylammonium ethyl) phosphorothiolate iodide
ecothiopate iodide	
endomyeinum	an antibiotic substance obtained from cultures of <i>Streptomyces endus</i>
endomycin	or the same substance produced by any other means
etamiphyllinum	7-(2 diethylaminoethyl) theophyllin
etamiphyllin	
ethinamatum	1-ethynylcyclohexyl carbamate
ethinamate	
ethotoinum	3-ethyl 5 phenylhydantoin
ethotoin	
ethylphenacemidum	phenylethylacetylurea
ethylphenacemide	
ethypiconum	4 6 dioxo 3 methyl 5 5 diethyl 1 4 5 6 tetrahydropyridine
ethypicone	
etoxeridinum	1-[2 (2 hydroxyethoxy)-ethyl]-4 phenylpiperidine-4-carboxylic acid
etoxeridine	ethyl ester
florantyrinum	$\gamma$ fluoranthene 8 yl $\gamma$ oxobutyric acid
florantyrone	

nystatinum nystatin	an antibiotic substance obtained from cultures of <i>Streptomyces</i> or the same substance produced by any other means
oleandomycin oleandomycin	an antibiotic substance obtained from cultures of <i>Streptomyces</i> or the same substance produced by any other means
ostreogrycinum ostreogrycin	an antibiotic substance obtained from cultures of <i>Streptomyces ostreogryceus</i> or the same substance produced by any other means
ovetadinum ovetadin	diethylaminoethyl- $\alpha$ -diethyl phenyl acetate
oxycinchopolum oxycinchopen	3-hydroxyphenyl-4-carboxylic acid
pentacyan chloridum pentacyan m chloride	N-(4-(5-cyano-5-diphenylpentyl)-N-dimethylammoniumethyl)-N-methylmorpholine d chloride
pentoxycinum pentoxyene	2-(2-diethylaminoethyl)-ethyl phenyl-1-pentenoate
petnchloral m petnchloral	pentacrythol chloral
phenaglycodolum phenaglycodol	2-chlorophenyl 3-methylbutane-2,3-diol
phenamazolinum phenamazoline	azulomethylimidazole
phenmetrazin m phenmetrazine	2-phenyl 3-methylmorpholine
phenobutodil m phenobutodil	(2,4,6-trimethylphenyl)-butyric acid
phenoxibenzaminum phenoxibenzamine	N-phenoxypropyl-N-benzyl- $\beta$ -chloroethylamine
phenoxymethylpenicillinum phenoxymethylpenicillin	an antibiotic in which the benzyl group of benzylpenicillin has been replaced by a phenoxymethyl group
phensulfamidum phensulfamide	1-methyl-3-phenyl-4,5-dioxo-pyridine
phenythulon m phenythulone	2-ethyl-2-phenylthiamorpholine-3,5-dione
phenyltoloxaminum phenyltoloxamine	2-( $\alpha$ -benzylphenoxy)-ethyl dimethylamine
phthalylsulfamethazolum phthalylsulfamethazole	5-phthalylsulfamidamido-methyl-1,3,4-thiadiazole
pemetremidum pemetremide	N-methyl-N-( $\beta$ -cetyl)-tropamide
pipenzolat bromidum pipenzolate bromide	N-methyl-N-ethyl-3-piperidine benzoate bromide
piperazin calcii edetas piperazine calcium edetate	a chelate produced by reacting edetic acid with calcium carbonate and piperazine
P pendolatum P pendolate	N-ethylpiperid-3-yl diphenylacetate

meprobamatum	2 methyl 2 propyl propane 1 3-diol dicarbamate
meprobamate	
mercaptapurinum	6 purinethiol
mercaptapurine	
mesuximidum	1 3 dimethyl 3 phenyl 2 5 dioxo-pyrrolidine
mesuximide	
methallenenestrium	3-(6-methoxy 2 naphthyl) 3-ethyl 2 2-dimethylpropionic acid
methallenenestriol	
methitalum	5 methylthioethyl 5-(2 pentyl) 2 thiobarbituric acid
methitalol	
methocidinum	hydroxymethylgramicidin
methocidin	
methopromazinum	2 methoxy 10-(3 dimethylaminopropyl) phenothiazine
methopromazine	
methoxyphedrinum	1 p-methoxyphenyl 1 methylamino-propan 1-one
methoxyphedrine	
methylphenidatum	a phenyl a (2 piperidyl) methyl acetate
methylphenidate	
methypylonum	3 3 diethyl 5 methylpiperidine 2 4-dione
methypylon	
midamalinum	N (5-chloro 2 benzimidazolylmethyl) N phenyl N N dimethyl
midamaline	ethylene diamine
monobenzonium	monobenzyl ether of hydroquinone
monobenzone	
morpheridinum	morpholinoethylnorpethidine
morpheridine	
natrii calcii edetas	calcium chelate of the disodium salt of ethylenediamino-N N N N
sodium calcium edetate	tetra acetic acid
natrii dioctylis sulfosuccinas	di β-ethylhexyl sodium sulfo-succinate
sodium dioctyl sulfosuccinate	
natrii diprotrizoos	sodium 3 5 dipropionylamino 2 4 6 trimodobenzoate
sodium diprotrizoate	
natrii radiochromas ( <sup>51</sup> Cr)	anionic hexavalent radioactive chromium ( <sup>51</sup> Cr) in the form of sodium
sodium radiochromate ( <sup>51</sup> Cr)	chromate
natrii radiophosphas ( <sup>32</sup> P)	radioactive phosphorus in the form of a mixture of sodium dihydrogen
sodium radiophosphate ( <sup>32</sup> P)	phosphate and disodium hydrogen phosphate
nudroxyzonum	5 nitro 2 furaldehyde 2 (2 hydroxyethyl) semicarbazone
nudroxyzone	
nitricholinii perchloras	2 hydroxyethyltrimethylammonium nitric acid ester perchlorate
nitricholinium perchlorate	
norethandrolonum	17 -ethyl 17 hydroxy 19 nor-4-androsten 3-one
norethandrolone	
norethisteronum	17 -ethinyl 19 nor-4 androsten 17 β-ol 3-one
norethisterone	
novobiocinum	an antibiotic substance obtained from cultures of <i>Streptomyces sphe</i>
novobiocin	<i>roudes</i> or the same substance produced by any other means

tetryzolinum	2-(1,2,3,4-tetrahydronaphth-1-yl)-2-imidazolene
tetryzoline	
thénalidim	1-methyl-4-[(2-thenyl)-n]piperidine
thénalidine	
thyrotrophin	thyrotrophic hormone
thyrotrophin	
tolbutamidum	N-p-tolylisobutyl-N-butyl-carbamate
tolbutamide	
tolpaminum	1-(1,2,3,6-tetrahydropyridino)-3-o-tolylisopropanol
tolpamine	
tridibethylidodim	3-hydroxy-3-phenyl-3-ethylpropylthylammonium iodide
tridibethylidodide	
trimeperidinum	1,5-trimethyl-4-phenyl-4-propionylpiperidine
trimeperidine	
trimetaphan	d-3,4,1,3-dibenzyl-2-keto-m-diazolide-1,1-trimethylene thiophanum
trimetaphan camphorsulfonate	d-camphorsulfonate
triprobidinum	1,4-bis(4-pyridyl)-3-pyrrolo-dimethyl-p-tolylisopropyl-ene
triprobidine	
vancomycin	an antibiotic substance obtained from cultures of <i>Streptomyces orientalis</i> or the same substance produced by any other means
vancomycin	
verazidum	1-nicotinoyl-2-erythridinehydrazine
verazide	
zorax lamium	m-o-5-chlorobenzoxazole
zoraxolam	

## Annex 1

### PROCEDURE FOR THE SELECTION OF RECOMMENDED INTERNATIONAL NON-PROPRIETARY NAMES FOR PHARMACEUTICAL PREPARATIONS

The following procedure shall be followed by the World Health Organization in the selection of recommended international non-proprietary names for pharmaceutical preparations in accordance with the World Health Assembly resolution WHA3.11

1. Proposals for recommended international non-proprietary names shall be submitted to the World Health Organization in the form provided for the purpose.

Such proposals shall be submitted by the Director General of the World Health Organization to the members of the Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations designated for this purpose for consideration in accordance with the General principles for guidance in devising international non-proprietary names appended to this procedure. The name used by the person discovering or first developing and marketing a pharmaceutical preparation shall be accepted, unless there are compelling reasons to the contrary.



pipradrolum	α α diphenyl α pipicrid 2 yl methanol
pipradrol	
polymyxinum B	an antibiotic substance obtained from cultures of <i>Bacillus polymyxo</i>
polymyxin B	or the same substance produced by any other means
prednisolonum	Δ <sup>2</sup> dehydro hydrocortisone
prednisolone	
prednisonum	Δ <sup>1</sup> dehydrocortisone
prednisone	
probenecidum	p-(di n propylsulfamoyl) benzoic acid
probenecid	
prochlorperazinum	1 [3 (2-chloro 10 phenothiazinyl) propyl]-4 methylpiperazine
prochlorperazine	
prodeconii bromidum	N N N N tetramethyl N N bis (carbo propoxymethyl) 2 13
prodeconium bromide	dioxatetradecane 1 14 diammonium dibromide
promazinum	10 (3 dimethylaminopropyl) phenothiazine
promazine	
promoxolanum	2 2 diisopropyl-4 hydroxymethyl 1 3 dioxolane
promoxolane	
propanocainum	3 diethylamino 1 phenylpropyl benzoate
propanocaine	
propazolamidum	2 propionamido 1 3 4-thiadiazole 5 sulfonamide
propazolamide	
propylhexedrinum	1 c) clohexyl 2 methylaminopropane
propylhexedrine	
prothipendylum	10 (3 dimethylaminopropyl) 1 azaphenothiazine
prothipendyl	
proxymetacainum	β diethylaminoethyl 3 amino-4 propoxy benzoate
proxymetacaine	
pyridostigminum	dimethylcarbamic ester of 1 methyl 3 hydroxypyridine
pyridostigmin	
pyrvinii chloridum	6 dimethylamino 2-[2 (2 5-dimethyl 1 phenyl 3 pyrrol) vinyl]-
pyrvinium chloride	1 methyl quinolinium chloride
racemoramidum	d 1 3 methyl 2 2 diphenyl-4 morpholinobutyrylpyrrolidine
racemoramide	
rescinaminum	3 4 5 trimethoxycinnamic acid ester of methyl reserpate
rescinamine	
spiramycinum	an antibiotic substance obtained from cultures of <i>Streptomyces ambo-</i>
spiramycin	<i>faciens</i> or the same substance produced by any other means
streptodornasum	enzyme obtained from cultures of various strains of <i>Streptococcus hemo-</i>
streptodornase	<i>lyticus</i> and capable of hydrolysing desoxyribonucleoproteins
streptokinasum	co-enzyme obtained from cultures of various strains of <i>Streptococcus</i>
streptokinase	<i>hemolyticus</i> and capable of changing plasminogen into plasmin
streptovarycinum	an antibiotic substance composed of several related components
streptovarycin	obtained from cultures of <i>Streptomyces sa labilis</i>
suspensio insulini cum zinco	a sterile buffered mixture of insulin zinc suspension (amorphous)
insulin zinc suspension	(30 per cent ) and insulin zinc suspension (crystalline) (70 per cent )

# MALARIA

## Some WHO publications

### CHEMOTHERAPY OF MALARIA

by Sir Gordon COVELL, G. R. COATNEY, John W. FIELD & Jaswant SINGH  
Monograph Series No 27 1953 123 pages 10 figures 14 tables bibliography index  
17/6 \$3.25 Sw fr 10.— (clothbound)

*This work by four eminent malarialogists constitutes a critical study of the most recent antimalarial drugs. It covers a very extensive field giving a brief general outline of the history of these drugs and examining the question of resistance to antimalarials. Each of the compounds in common use is analysed as to its chemical structure, activity, toxicity, contra-indications, dosage, absorption and elimination and plasma concentration.*

### MALARIA CONTROL

Bulletin of the World Health Organization 1954 Vol 11 No 4-5 337 pages, 66 figures, 73 tables  
[Articles in English or French, with detailed summary in the other language]  
£1 \$3.00 Sw fr 12.—

*This number makes a valuable contribution to the literature on malaria. It describes the new strategy in malaria control since the development in mosquitoes of resistance to insecticides—a strategy by which early eradication of malaria over vast areas may be anticipated. The work provides a general picture of the present situation regarding control by means of residual insecticides illustrating the success and limitations of the method and the problems it gives rise to in many countries and areas. Other articles deal with the ineffectiveness of DDT spraying in the Jordanian desert, the effects of suspended residual spraying and of imported malaria in the USA, the resistance of Anopheles sacharovi to DDT and to chlordane and the possibility of control by DDT by Anopheles albimanus.*

### 1A TERMINOLOGY

by Sir Gordon COVELL, Philip F. RUSSELL & N. H. SWELLENGREBEL  
Monograph Series No 13 1953 8 pages 8 figures  
\$1.00 Sw fr 4.—

*This work is divided into two parts: (1) a commentary on the terms used by malaria workers excluding terms relating to engineering techniques and insecticide sprayers and (2) a detailed glossary of those terms.*

pipradrolum	$\alpha$ $\alpha$ diphenyl $\alpha$ piperid 2 yl methanol
pipradrol	
polymyxinum B	an antibiotic substance obtained from cultures of <i>Bacillus polymyoxor</i>
polymyxin B	or the same substance produced by any other means
prednisolonom	$\Delta^1$ -dehydro hydrocortisone
prednisolone	
prednisonum	$\Delta^1$ dehydrocortisone
prednisone	
probenecidum	p (di n propylsulfamoyl) benzoic acid
probenecid	
prochlorperazinum	1 [3 (2-chloro 10 phenothiazinyl) propyl]-4 methylpiperazine
prochlorperazine	
prodeconii bromidum	N N N N tetramethyl N bis (carbo propoxymethyl) 2 13
prodeconium bromide	dioxatetradecane 1 14-diammonium dibromide
promazinum	10 (3 dimethylaminopropyl) phenothiazine
promazine	
promoxolanum	2 7 diisopropyl-4 hydroxymethyl 1 3 dioxolane
promoxolane	
propanocainum	3 diethylamino-1 phenylpropyl benzoate
propanocaine	
propazolamidum	2 propionamido 1 3 4-thiadiazole 5 sulfonamide
propazolamide	
propylhexedrinum	1 cyclohexyl 2 methylaminopropane
propylhexedrine	
prothipendylum	10 (3 dimethylaminopropyl) 1 azaphenothiazine
prothipendyl	
proxymetacainum	$\beta$ diethylaminoethyl 3 amino-4 propoxy benzoate
proxymetacaine	
pyridostigminum	dimethylcarbamic ester of 1 methyl 3 hydroxypyridine
pyridostigmin	
pyrvinii chloridum	6 dimethylamino 2 [2-(2 5-dimethyl 1 phenyl 3 pyrrol) vinyl]-
pyrvinium chloride	1 methyl-quinolinium chloride
racemoramidum	d 1 3 methyl 2 2 diphenyl-4-morpholinobutylpyrrolidine
racemoramide	
rescinaminum	3 4 5 trimethoxycinnamic acid ester of methyl reserpate
res innamine	
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streptokinase	<i>hemolyticus</i> and capable of changing plasminogen into plasmin
streptovarycinum	an antibiotic substance composed of several related components
streptovarycin	obtained from cultures of <i>Streptomyces variabilis</i>
suspensio insulini cum zinco	a sterile buffered mixture of insulin zinc suspension (amorphous)
insulin zinc suspension	(30 per cent ) and insulin zinc suspension (crystalline) (70 per cent )

## Annex 2

### GENERAL PRINCIPLES FOR GUIDANCE IN DEIVING INTERNATIONAL NON-PROPRIETARY NAMES

1. Names should preferably be free from any anatomical, physiological, pathological or therapeutic suggestion.
2. An attempt should first be made to form a name by the combination of syllables in such a way as to indicate the significant chemical grouping of the compound and/or its pharmacological classification. Preference should be given to the following syllables:

L	Latin	French	
in m	ine	ine	for alkaloid and organic bases
in m	in	ine	for glycerides and neutral principles
ol m	ol	ol	for alcohols and phenols (-OH group)
al um	al	al	for aldehydes
on m	one	one	for ketones and other substances containing the CO group
en m	ene	ène	for unsaturated hydrocarbons
an m	ane	ane	for saturated hydrocarbons
ca n m	cano	caïne	for local anæsthetics
mer	mer	me	for mercurial compounds
ifon m	sulfone	sulfone	for sulfone derivatives
qu num	quine	quine	for antimalarial substances containing a quinoline group
ci num	crine	crine	for antimitotics; substances containing an acidic group
sulfa	sulfa	sulf	for derivatives of sulfanilamide
d on m	dione	dione	for anti-epileptics derived from oxazolidinedione
lo um	toin	toïne	for anti-epileptics derived from hydantoin
ig m n m	igmine	igmine	for anticholinesterases

3. Names should be distinct and not misleading. They should not be inconveniently long and should not be liable to confusion with names already in use.

4. The addition of a terminal capital letter or number should be avoided as far as possible.

5. Names proposed by the person discovering or first developing and marketing a pharmaceutical preparation or already officially adopted, any country or used in the national pharmacopoeias or in works of reference such as New and Non-official Remedies should receive preferential consideration.

3 Subsequent to the examination provided for in article 2 the Director General of the World Health Organization shall give notice that a proposed international non proprietary name is being considered

A Such notice shall be given by publication in the *Chronicle of the World Health Organization* and by letter to Member States and to national pharmacopoeia commissions or other bodies designated by Member States

(i) Notice may also be sent to specific persons known to be concerned with a name under consideration

B Such notice shall

(i) set forth the name under consideration

(ii) identify the person who submitted a proposal for naming the substance if so requested by such person

(iii) identify the substance for which a name is being considered

(iv) set forth the time within which comments and objections will be received and the person and place to whom they should be directed

(v) state the authority under which the World Health Organization is acting and refer to these rules of procedure

C In forwarding the notice the Director General of the World Health Organization shall request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the proposed name during the period it is under consideration by the World Health Organization

4 Comments on the proposed name may be forwarded by any person to the World Health Organization within four months of the date of publication under article 3 of the name in the *Chronicle of the World Health Organization*

5 A formal objection to a proposed name may be filed by any interested person within four months of the date of publication under article 3 of the name in the *Chronicle of the World Health Organization*

A Such objection shall

(i) identify the person objecting

(ii) state his interest in the name

(iii) set forth the reasons for his objection to the name proposed

6 Where there is a formal objection under article 5 the World Health Organization may either reconsider the proposed name or use its good offices to attempt to obtain withdrawal of the objection Without prejudice to the consideration by the World Health Organization of a substitute name or names a name shall not be selected by the World Health Organization as a recommended international non proprietary name while there exists a formal objection thereto filed under article 5 which has not been withdrawn

7 Where no objection has been filed under article 5 or all objections previously filed have been withdrawn the Director General of the World Health Organization shall give notice in accordance with subsection A of article 3 that the name has been selected by the World Health Organization as a recommended international non proprietary name

8 In forwarding a recommended international non proprietary name to Member States under article 7 the Director General of the World Health Organization shall

A request that it be recognized as the non proprietary name for the substance and

B request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the name including prohibiting registration of the name as a trade mark or trade name

# MALARIA

## Some WHO publications

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Bulletin of the World Health Organization 1954 Vol. 11 No. 4-5 382 pages 66 figures 78 tables  
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### MALARIA TERMINOLOGY

by Sir Gordon COVELL, Paul F. RUSSELL & N. H. SWELLEN-GREBEL  
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*This booklet is divided into two parts: (1) a commentary on the terms used by malarialogists (excluding terms relating to engineering techniques and insecticide sprayers and the names of antimalarial drugs) and (2) a detailed glossary of those terms.*

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BULLETIN OF THE WORLD HEALTH ORGANIZATION

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# TECHNICAL CONFERENCE ON RESISTANCE TO INSECTICIDES

## Proposals for an international programme of research

In its seventh report the WHO Expert Committee on Insecticides<sup>1</sup> noted that resistance to insecticides of the chlorinated hydrocarbon type had been confirmed or suspected in 37 species of insects of actual or potential public health importance. Since that time resistance has appeared in several other species and to other insecticides. It is obvious therefore that unless a speedy answer to this problem is found resistant populations of insects will take the place of the present susceptible ones and the eradication and vector control programmes will not merely be brought to a standstill but the ground already gained will be lost.

The Committee recommended that WHO should assume leadership in the stimulation and co-ordination of an international research programme on the resistance problem. As a first step in this direction a Technical Conference was held in Geneva from 25 to 31 July 1957. It was attended by directors of the major laboratories able to participate in an international research programme.<sup>2</sup> The conclusions and recom-

mendations summarized below are based on an unpublished report (WHO/Insecticides 66) prepared after the conclusion of the Conference.

### Need for international co-ordination

Paradoxically the more intensively the policy of vector control and eradication is pursued and the wider the area covered the more serious does the problem of resistance become. It is in fact increasing in complexity and magnitude more rapidly than progress is being made in its elucidation. It is important that this should be realized and that, when funds are allocated for vector control and eradication programmes a portion should be set aside for financing research including investigations into the resistance problem. Although WHO has already sponsored a number of research projects on resistance and significant advances have been made, lack of financial support has so far prevented the problem from being studied with the urgency and intensity that the situation demands. Not only has there been too little research but owing to lack of co-ordination it has been concentrated on too few aspects of the problem. Research on an international basis is essential if practical solutions to the many resistance problems are to be hoped for in the foreseeable future but such a research programme will be successful only if properly co-ordinated. The Conference was of the opinion that WHO is the only international organization in a position to perform this co-ordinating function.

### Training and recruitment of personnel

Research on insecticide resistance is at present hampered not only by lack of funds and facilities but also by a shortage of

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The participants were: Dr A. L. Bertl, J. F. de la Druas, Gu. de M. ar. lo. p. a. M. m. s. e. r. d. e. S. a. n. i. t. a. t. i. o. n. e. s. A. s. e. n. t. e. S. a. c. i. a. l. M. a. r. n. e. V. e. n. e. z. u. e. l. Dr D. D. r. e. d. e. n. d. e. r. L. a. b. o. r. a. t. o. r. y. f. o. r. R. e. s. e. a. r. c. h. o. n. B. i. o. c. h. e. m. i. s. t. r. y. C. e. n. t. r. a. l. N. a. t. i. o. n. a. l. C. o. u. n. c. i. l. f. o. r. A. p. p. l. i. e. d. S. c. i. e. n. c. e. R. e. s. e. a. r. c. h. i. n. t. h. e. N. e. t. h. e. r. l. a. n. d. s. L. i. t. t. e. r. a. t. u. r. e. d. a. s. Dr R. A. E. G. l. e. y. D. i. r. e. c. t. o. r. C. l. o. n. a. l. P. r. o. d. u. c. t. s. L. a. b. o. r. a. t. o. r. y. L. o. n. d. o. n. U. S. e. d. K. g. d. o. m. Dr J. H. a. m. o. n. C. h. e. f. L. a. b. o. r. a. t. o. r. y. S. e. r. v. i. c. e. G. e. n. e. r. a. l. D. i. s. t. r. i. c. t. D. e. P. r. o. p. h. i. l. a. t. i. o. n. B. e. l. g. i. u. m. Dr J. J. a. s. s. o. L. i. p. p. e. r. V. o. l. t. a. F. r. e. n. c. h. W. e. s. A. f. r. i. c. a. Dr H. L. a. v. e. n. M. P. l. a. n. c. k. I. n. s. t. i. t. u. t. f. u. r. B. i. o. l. o. g. i. e. T. u. b. i. n. g. e. n. G. e. r. m. a. n. y. Dr A. W. L. i. d. g. u. e. H. d. L. i. c. e. n. s. e. S. e. c. t. o. r. M. a. n. d. A. n. i. m. a. l. S. o. c. i. e. t. y. E. n. t. o. m. o. l. o. g. i. c. a. l. R. e. s. e. a. r. c. h. U. S. D. e. p. a. r. t. m. e. n. t. f. A. g. r. i. c. u. l. t. u. r. e. B. e. t. h. s. v. i. l. l. e. M. d. L. S. A. Dr E. M. o. n. a. D. i. r. e. c. t. o. r. P. a. r. a. s. i. t. o. l. o. g. y. L. a. b. o. r. a. t. o. r. y. I. n. t. e. r. S. p. e. c. i. a. l. S. e. c. t. o. r. S. a. n. i. t. a. t. i. o. n. Dr A. M. K. D. Q. u. a. r. t. e. r. m. a. n. (C. h. a. i. r. m. a. n). C. h. e. f. T. e. c. h. n. i. c. a. l. D. e. v. e. l. o. p. m. e. n. t. L. a. b. o. r. a. t. o. r. y. C. o. m. m. u. n. i. c. a. b. l. e. D. i. s. e. a. s. e. C. e. n. t. e. r. U. S. P. u. b. l. i. c. H. e. a. l. t. h. S. e. r. v. i. c. e. S. a. n. a. t. o. n. G. a. U. S. A. Dr A. A. S. b. a. r. b. y. D. i. r. e. c. t. o. r. I. n. s. e. c. t. C. o. n. t. r. o. l. S. e. c. t. i. o. n. M. i. n. i. s. t. r. y. o. f. P. u. b. l. i. c. H. e. a. l. t. h. C. a. i. r. E. g. y. p. t. L. i. b. e. r. t. i. a. n. C. o. l. o. n. e. l. J. a. s. S. a. h. (V. i. c. e- C. h. a. i. r. m. a. n). D. i. r. e. c. t. o. r. M. a. r. i. t. i. m. e. U. S. I. d. a. D. e. l. h. i. U. S. A. Dr F. W. W. i. n. e. r. m. a. n. O. f. f. i. c. e. r. i. n- C. h. a. r. g. e. B. i. o. c. h. e. m. i. s. t. r. y. S. e. c. t. i. o. n. P. e. s. I. n. f. e. c. t. i. o. n. L. a. b. o. r. a. t. o. r. y. S. l. o. u. g. h. U. K. K. i. n. g. d. o. m.

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insect biochemical laboratory with good chemical facilities. In the later stages field trials will be essential.

### Main lines of research

The Conference found it convenient to discuss the fundamental attack on the problem of resistance under five main headings: genetics, physiology, biochemistry, ecology and development of new insecticides.

### Genetics

A complete understanding of the physiology of resistance can only be gained by studies on pure homozygous resistant strains. It is certain that even in the case of a single species and a single insecticide several different genetic mechanisms may be responsible for the transmission of resistance. In selecting suitable insect vectors for genetic study the following criteria should be adopted:

- (i) They should be easily and quickly reared at low cost and require little space.
- (ii) They should have a short generation period and high fecundity.
- (iii) They should have a small number of chromosomes.

The Conference suggested the use of ionizing radiations or chemicals to speed up the mutation rate as has been done with *Culex*. The object is to obtain test strains with a high number of marker genes and so to construct a system of formal genetics for the insect species concerned. By carefully planned cross breeding experiments it should then be possible to establish in a relatively short time the genetic factors responsible for resistance in a field population. Another approach would be to compare survival rates in resistant and susceptible strains of known chromosomal types both under normal conditions and under insecticidal pressure. Such studies could be carried out in cages—for example on mosquitoes and on the housefly—and should yield results of considerable significance as they would simulate field conditions.

### Physiology

The Conference recommended that the emphasis should be on comparative studies of the following subjects:

(i) Absorption of the insecticide through the integument. This has been shown to be a factor of minor importance in many strains resistant to DDT but its possible significance in relation to other types of resistance needs further investigation.

(ii) Role of the nerve sheath. This sheath has a very peculiar structure in insects and evidence has recently been obtained that it plays an important part in regulating the concentrations of ionized compounds in the nervous system. It would appear well worth while to study this question in greater detail especially the possible influence of insecticides on the permeability of the sheath.

(iii) Relation between fat content and insecticide tolerance including an assessment of the storage and detoxicating capacities of the fat body.

(iv) Functions and composition of the haemolymph. Very little is known even about such elementary facts as how much haemolymph an insect has and how fast it circulates.

(v) "Natural tolerance" and "vigour tolerance". The nature of these phenomena and their significance need further elucidation.

The negative correlation between susceptibilities to different groups of insecticides should also repay investigation. If suitable pairs of insecticides could be found they could be used either in combination to prevent or postpone the development of resistance or singly in case where resistance to one of them has already developed. The use of non-toxic chemicals that influence the behaviour of insects—for example repellents and attractants—offers another possible approach and the Conference recommended fundamental research on the mode of action of these compounds. With a view to finding hormone based insecticides the study of

suitably trained personnel. The Conference believed that one of the most effective ways of attracting scientific workers into this field was to stimulate interest at the undergraduate level by means of lectures delivered by qualified persons in close contact with the problem. It was also suggested that discussion of the insecticide resistance problem should be introduced into the curricula of courses in public health and tropical medicine. It will be necessary to make available facilities for training personnel at all levels from junior technical assistants to qualified scientists. Such training may take the form of

(i) a formal post graduate course at a university

(ii) a visit for some months to a laboratory at which special techniques have been developed

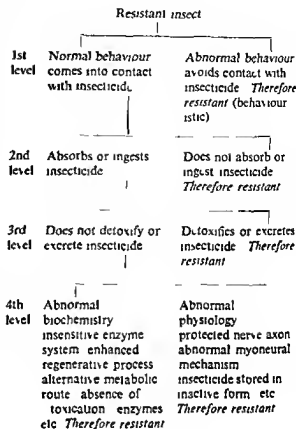
(iii) a relatively elementary course of lectures and practical work for the junior staff

The Conference also emphasized the value of international meetings of scientists working on resistance problems. They believed that such meetings would help to stimulate research and attract potential workers. At the same time the first hand exchange of ideas would provide an effective guard against unnecessary duplication of work and would ensure integration of the results.

#### Centralized and field research

There is a need both for basic laboratory investigation and for applied field research. Basic research can best be carried out in well equipped central laboratories with good library facilities and opportunities for contact with other research workers. It has been found that it costs almost twice as much to maintain a research worker at a field laboratory in Africa as at a central laboratory in the United Kingdom. There are some problems however that can only be studied satisfactorily in the field. The Conference made the following classification of research on insecticide resistance

(a) *Identification of the resistance mechanism* This can be further broken down as follows



Work at the first and second levels could be carried out by experienced entomologists either in the field or in fairly simply equipped laboratories. Work at the third and fourth levels involves basic research requiring specialized techniques and would best be carried out in well equipped central laboratories.

(b) *Study of ecological and genetic factors* Facilities for insect breeding accurate dosing etc. would be adequate for such research which could be carried out in field laboratories.

(c) *Counter measures* The pattern of this work will depend largely on which mechanism of resistance is found to be the most important. Much of the work will have to be done in close collaboration with manufacturing and pest control organizations and the early stage will require research in a well equipped

the pyrethrins and the synthetic pyrethroids which are the most effective space sprays at present in use. Another field deserving of further study is the use of synthetic esters of chrysanthemum monocarboxylic acid as larvicides.

One of the most promising lines of approach seems to be the search for enzyme inhibitors. Iodoacetic acid is known to inhibit triosephosphate dehydrogenase and it has been shown to be toxic to houseflies resistant to chlorinated hydrocarbons. Studies of esters and related compounds are under way. Fluoroacetic acid and its amide are inhibitors of cis-aconitase and are highly toxic to insects. Though they are not suitable for practical application it may be that more useful inhibitors can be found. It has also been reported that L-glutamic acid oxidase is inhibited by low concentrations of rotenone and it would be interesting to look for other inhibitors of this enzyme. Finally there is the possibility of producing metabolic exhaustion by inhibiting the formation of high-energy phosphate bonds. Two insecticides which act in this way—4,6-dinitro-o-cresol and pentachlorophenol—are already in use but further investigation of this system is needed.

It is hoped that biochemical studies will disclose the sites and modes of action of other existing or potential insecticides including such substances as ryanodine, the veratrine alkaloids and the N-isobutylamides and that from this knowledge it will be possible to proceed to the synthesis of compounds with more useful properties.

#### Conclusions and recommendations

In summary, up to its deliberations the Conference again stressed the dynamic nature of the resistance problem which is increasing in severity from day to day. Empirical methods of attack have largely failed or given only temporary success. On the other hand fundamental research and development are slow and are concentrated at relatively few centres in different parts of the world usually widely separated from the areas where the

resistant vectors are found. The Conference therefore recommended that prompt action should be taken by WHO to co-ordinate these activities along the lines suggested in the report. The directors of the laboratories attending the Conference unanimously agreed to participate in an international programme of research and proposed that a copy of the report should be sent to laboratory directors not present together with a letter inviting their participation.

It was felt that in addition to enlisting the support of international governmental and private agencies and assisting laboratories in planning research projects WHO could perform a valuable service by facilitating the dissemination of information. Rapid exchange of information would greatly stimulate and accelerate research. The Conference therefore urged that abstracts or summaries of research papers should be sent to WHO at the same time as they were submitted for publication and that interesting findings not intended for publication should also be communicated to WHO for possible inclusion in the information circular published every two months. Emphasis was also placed on the value of a free interchange of scientific personnel between the laboratories taking part in the programme and an increase in the number of fellowships for international travel was advocated. Progress would be helped by the early development and adoption of international standard tests for measuring physiological resistance and for the quantitative assessment of behavioural response to insecticides. An important recommendation concerned the facilitation of the supply and exchange of research material particularly insect strains of special research interest, rare biological chemicals and isotopically labelled insecticides and related compounds. It was felt that the good offices of WHO could be of great value in making such material available and accelerating its travel across international borders.

In an appendix to the report of the Conference a list of 57 suggested research projects on insecticide resistance is given. On 17 of these projects investigations have already commenced.

insect hormones should be more actively pursued. Insecticides of this type would have the important advantage of being non toxic to man and animals. On the other hand resistance to them might still develop.

### *Biochemistry*

The first aim of biochemical research must be to determine the site of action of the insecticide as this will focus attention on the vital systems which might be inhibited. In the absence of evidence for a biochemical action a biophysical action might be considered. It has recently been suggested that the molecular configuration of DDT together with its thermodynamic properties enables it to disrupt the nerve membrane lattice. An attempt should be made to confirm or disprove this hypothesis. If it is found to be correct a similar explanation would presumably apply to other chlorinated hydrocarbons.

A comparative study of the biochemistry of normal and resistant strains should throw considerable light on the mechanisms of resistance. The depletion of proline in the blood of insects exposed to DDT is an example of the kind of difference that may be found. The catabolic fate of the insecticides in susceptible and resistant strains must be studied and a search made for toxic metabolites in the blood or organs. Certain organophosphorus insecticides are not toxic in themselves but are oxidized to toxic products in the body of the insect. It is possible that in resistant strains this so-called toxication process fails to occur.

Once evidence has been obtained that certain biochemical mechanisms appear to be responsible for resistance, quantitative studies will have to be made on the mode of inheritance of these systems. Biochemical and genetic studies are thus complementary.

### *Ecology*

Changes in behaviour of insect populations following extensive spraying operations enabling the insects to escape the action of the insecticide have frequently been reported. To enable the validity of these reports to be checked, comparative studies of the ecology of normal and resistant populations are

needed. Particular attention should be given to biting and resting habits (whether indoor or outdoor), breeding areas and changes in life cycles or biotic potentials such as increased fecundity or viability. The Conference recommended that laboratory tests should be worked out to enable quantitative measurements to be made of what might be considered the normal levels of behaviour of field populations. Such tests would be particularly useful in areas where control measures have not yet been applied but are planned for the near future.

### *Development of new insecticides*

The ideal insecticide for vector control programmes should combine high toxicity to insects and prolonged residual action with low mammalian toxicity and should be inexpensive. The organophosphorus insecticides have attracted much attention because they are effective against insects resistant to compounds of the chlorinated hydrocarbon type but organophosphorus compounds combining long lasting residual action with low mammalian toxicity are still lacking. Moreover resistance to certain of these insecticides has already appeared in *Musca*, *Aedes* and *Culex* in isolated areas. Laboratory evidence suggests that flies resistant to malathion are susceptible to parathion and diazinon and that chlorthion resistant flies are susceptible to closely related compounds. It is essential that field evidence on the cross tolerance of these compounds should be obtained at the earliest opportunity. If the mechanisms of resistance can be demonstrated by biochemical investigations it may be possible to overcome them by suitable modifications in the structure of the insecticides or by combining them with synergists—for instance with compounds capable of blocking detoxication enzymes.

The carbamate or urethane insecticides which act by blocking cholinesterase do not appear to exhibit cross tolerance with the organophosphorus insecticides and were recommended for further study. Pyrolan and isolan have already been of limited value in vector control programmes.

Species resistant to the chlorinated hydrocarbons can also be attacked successfully with

the pyrethrins and the synthetic pyrethroids which are the most effective space sprays at present in use. Another field deserving of further study is the use of synthetic esters of chrysanthemum monocarboxylic acid as larvicides.

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In an appendix to the report of the Conference a list of 57 suggested research projects on insecticide resistance is given. On 17 of these projects investigations have already commenced.



# EUROPEAN SEMINAR ON VETERINARY PUBLIC HEALTH

As part of a continuing effort to promote increased recognition of veterinary public health problems and to stimulate the development of services to deal with them the WHO Regional Office for Europe in late 1957 sponsored a third seminar on this subject. The previous meetings held in Vienna in November 1952 and in Copenhagen in February 1954 were concerned with five specific zoonoses<sup>1</sup> and with meat hygiene<sup>2</sup> respectively. At this third seminar which took place in Warsaw from 25 November to 4 December 1957 physicians and veterinarians from 23 European countries met to consider (1) the scope and organization of services relative to veterinary public health and food hygiene and (2) six zoonoses of importance to most of the countries represented. Sessions on the first topic were attended by 38 participants from Austria, Belgium, Bulgaria, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Morocco, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, the USSR, and Yugoslavia; an additional 30 Polish physicians and veterinarians particularly concerned with the zoonoses were present at the discussions of these diseases. The Food and Agriculture Organization of the United Nations was also represented at the seminar.

The purposes of the seminar were to call attention to recent technical advances in veterinary public health and to show ways and means appropriate to conditions in the different countries of the European Region of securing the closest possible collaboration between veterinary and public health personnel in coping with problems which cannot be handled adequately by either veterinary or public health services alone. The programme included films on relevant subjects

laboratory demonstrations and visits by the participants as guests of the Polish Government to the Veterinary Institute in Pulawy which is concerned principally with research and the production and testing of biological products and to the State Institute of Rural Occupational Medicine and Hygiene in Lublin.

## SCOPE AND ORGANIZATION OF VETERINARY PUBLIC HEALTH SERVICES

### Interrelationship of human and animal health

Dr J. H. Steele, Chief of Veterinary Public Health, United States Public Health Service Communicable Disease Center, Atlanta, Ga., introduced the subject of the interrelationship of human and animal health pointing out the importance not only of the zoonoses and food hygiene in which the connecting links between man and animals are apparent but also of problems which are not so readily recognized such as radio activity levels in animal products. He spoke also of the contributions comparative medicine can make to the study of the common degenerative diseases which are among the most serious public health problems in many countries today—cardiovascular disorders and cancer in particular. In the USA, for example, investigations of the prevalence of these two types of disease in animals and of the ecological conditions under which they occur are being inaugurated and together with related basic research in physiology and pathology are expected to yield over a number of years results which may do much to clarify the etiology of cancer and cardiovascular disorders in man.

The known zoonoses will doubtless continue to be of public health concern but as was noted in the course of the discussions many other zoonoses either actually emerging as new disease entities or merely being uncovered by improved techniques may

The participants included: Austria, Belgium, Bulgaria, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Morocco, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, the USSR, and Yugoslavia; an additional 30 Polish physicians and veterinarians particularly concerned with the zoonoses were present at the discussions of these diseases. The Food and Agriculture Organization of the United Nations was also represented at the seminar.

demand increasing attention in the future. For instance, apparently specific antibodies for human poliomyelitis have been found in animal sera (cattle and swine) and evidence is being accumulated that cytopathogenic viruses analogous to the ECHO viruses<sup>2</sup> in human beings can be isolated from the gastro-intestinal tract of animals. Still another possible relationship between animal and human disease is being investigated by WHO in a co-ordinated study in 25 countries of the role of swine and other domestic animals in the epidemiology of human influenza. It is known that swine were infected with the human strain of influenza virus responsible for the devastating 1918 pandemic and swine influenza caused by virus strains related to human influenza strains has been well defined since 1918 but it is not known whether swine first became infected with the human influenza viruses at the time of the 1918 pandemic or whether the pandemic actually originated from the infection in swine. Similarly consideration is being given to the possibility that the 1957 pandemic of influenza might have originated from swine or another animal.

### Ecology of the zoonoses

The subject of the ecology of the zoonoses was introduced by a paper by Dr I. G. Galuso, Director of the Institute of Zoology, Academy of Sciences of the USSR, Alma Ata, Kazakh SSR. Dr Galuso described in detail the theory and its practical applications of natural foci of diseases. According to this theory, which is expounded by Professor Y. N. Pavlovsky and his school in the Soviet Union, the zoonoses may be distinguished from other infectious diseases of man by their special epidemiological and ecological characteristics. The sources of human infection are animal and the infective principle may pass between animals in nature independently of man. This is particularly true with respect to virgin territories previously uninhabited by man; the diseases are usually associated with definite geographical landscapes and have a seasonal

occurrence and a well balanced natural ecology has been established in these areas over the years. But when such areas become inhabited by man, he intrudes upon the natural cycle of infection and as a consequence becomes infected himself. Tick and insect transmission often play a prominent part in this group of zoonoses. A number of important diseases are considered to fall within the framework of this concept: tick-borne encephalitis, Japanese B encephalitis, plague, tularemia, tick-borne rickettsioses, cutaneous leishmaniasis, many parasitic infections and to some extent diseases such as psittacosis (ornithosis) and brucellosis.

Pavlovsky's theory has given rise to very fruitful field studies by large groups of collaborating scientists in the Soviet Union, Poland and Czechoslovakia. Other countries have recognized the epidemiological logic supporting this theory and have undertaken appropriate investigations, but large scale applications have been made chiefly by Soviet scientists.

### Food hygiene

Discussions on food hygiene were led by Dr W. C. Cockburn, Director of the Epidemiological Research Laboratory, Central Public Health Laboratory, London, England, and Dr A. Jepsen, Professor of Food Hygiene and Microbiology, Royal Veterinary College of Denmark in Copenhagen. Emphasis was given to meat and milk hygiene and to processed food.

Techniques used in the United Kingdom since 1949 for investigating outbreaks of food-borne diseases have proved very efficient and have enabled British authorities to obtain a much more accurate idea of the significance of these diseases than was formerly possible. In 1956 some 18,000 persons were reported to have been affected by food poisoning, but it was stressed that the cases reported undoubtedly gave only a partial picture of the situation. Over 70% of the outbreaks investigated from 1949 to 1956 were due to meat, with processed and made up meat accounting for more than 85% of the meat-borne infections.

*Salmonella* infection is the greatest single cause of food borne diseases with meat and eggs (usually dried or frozen) being the worst offenders. In 1953 in Sweden a meat borne *Salmonella* epidemic affected more than 9000 people and 2000 cases were reported the following year no doubt partially as a carry over from the widely seeded infection of the previous year.

The epidemiological and laboratory services required for the investigation of outbreaks of food poisoning were discussed in detail. It was stressed that only by close collaboration among public health veterinary and sanitary services can an effective food hygiene control programme be established. The importance of better hygiene among food handlers was pointed out and in this connexion the recommendations of the WHO/FAO Expert Committees on Meat and Milk Hygiene<sup>4</sup> were considered very valuable.

Dr E. Holager, Chief Veterinary Public Health Officer, Hamar, Norway, who served as veterinary public health consultant to the WHO Regional Office for Europe, then spoke of the problem of by-products of abattoirs and their significance in the transmission of diseases to man and animals. The use of destructor plants for economic salvage of carcasses was described and their possible application in countries not yet employing them was suggested.

### Veterinary public health practice

The organization and administration of national, provincial, municipal and rural veterinary public health services were discussed by Dr J. Parnas, Director of the State Institute of Rural Occupational Medicine and Hygiene and Professor at the Academy of Medicine in Lublin, Poland. Dr Parnas emphasized the necessity for establishing close links between health and agricultural services. At the national, provincial and municipal levels it is of basic importance to have a veterinary health unit within the public health services to co-ordinate activities

relative to the control of the zoonoses and food hygiene and to stimulate efforts to improve and expand such activities. In rural areas the practising veterinarian or his assistant can give valuable support in reporting and controlling the zoonoses and in improving food hygiene. Dr Parnas described some of the work of his Institute where studies in rural areas of brucellosis, leptospirosis and bovine tuberculosis were undertaken by teams of physicians, veterinarians, zoologists and other professional workers.

In the discussion which followed Dr Parnas's talk it was noted that some European countries have established veterinary public health units such as those described while others are including such units within the agricultural services. It was generally agreed that the organization of a veterinary public health unit within the administrative framework of either the health or the agricultural services would give considerable impetus and effectiveness to efforts to deal with the many problems and untapped resources pertinent to human and animal health relationships. Dr D. Stadić, Veterinarian of the Research Institute of the Republic of Serbia and Adviser on Veterinary Public Health to the Central Public Health Institute of Yugoslavia in Belgrade, covered the subject of collaboration among workers in the medical, veterinary, sanitary and allied disciplines.

### Reporting of the zoonoses

Dr M. Kaplan, Chief of the Veterinary Public Health Section at WHO Headquarters, and Dr Steele introduced the discussion of mechanisms for more efficient reporting of the zoonoses. An adequate morbidity reporting system is essential for the successful control of all communicable diseases; rabies provides a good example of a disease with regard to which control and possible eradication within a country or a specific area are dependent on satisfactory reporting of cases. In many countries the reporting of the zoonoses constitutes a weak link in the morbidity statistics system. Full information on these diseases can be obtained only through

co operation between private veterinary practitioners and the official veterinary and public health services

It has been found that simplified reporting forms usually cards bearing a list of the major zoonoses and other purely veterinary diseases of the area in question are an aid in promoting better reporting. Such forms are sent to private practitioners and provincial veterinary offices in both the public health and agricultural services and the compiled returns are distributed periodically to all interested persons

The initiative for improving the reporting system can be taken by the public health veterinarian attached to the health services of a region who in co-operation with his counterpart in the agricultural services can stimulate the inauguration of a periodic reporting service appropriate to the problems and needs of the particular area. The information derived from smaller areas should be relayed to the provincial and national veterinary public health services

It was pointed out in the discussions that in areas where there is a lack of veterinarians it is often possible to use the services of an assistant trained in specific veterinary techniques for reporting suspected outbreaks of zoonoses to the health or agricultural services. Fortunately most European countries have available trained veterinarians to follow up at short notice any suspected outbreaks of serious epizootic diseases

The reporting of food poisoning outbreaks usually requires a separate closely knit organization such as the public health laboratory and epidemiological service set up for this purpose in the United Kingdom. In food poisoning outbreaks very rapid on the spot investigations are necessary in order to obtain accurate histories and specimens of the suspected food which must be submitted to laboratories for examination

#### Training of personnel

The topic of training personnel to meet the responsibilities of veterinary public health was discussed by Professor R. Vuillaume, Chief of Veterinary Services of the Ministry

of Agriculture Paris France. Dr Vuillaume drew attention to the necessity of introducing the undergraduate veterinary and medical student to the problems common to both disciplines. Since 1955 veterinary public health has been included as an "elective" subject in the senior year of the undergraduate veterinary curriculum in France

Even more important is the need to provide for the training of graduate veterinarians in public health as is done in North and South America. Facilities and opportunities for such training are practically non-existent in Europe at the present time and the WHO Regional Office for Europe has recognized the need for them and is taking steps to remedy the situation. It was noted that the High Institute of Public Health in Alexandria, Egypt in 1957 inaugurated special lecture and laboratory courses in veterinary public health for post graduate physicians and veterinarians which will become a regular part of the curriculum. A special course in veterinary public health is scheduled for 1959 at the School of Public Health in Zagreb

#### ADVANCES IN THE CONTROL OF SPECIFIC ZOOSES

##### Tick borne encephalitis

Dr D. Blaskovic, Director of the Virology Institute, Czechoslovak Academy of Sciences, Bratislava gave a summary of the present knowledge of tick borne encephalitis which is a cause of increasing concern in some European countries including Austria, Czechoslovakia, Poland, the Soviet Union and Yugoslavia. Individual outbreaks involving as many as 600 people in a single village in Czechoslovakia several years ago were described. While the tick has been shown to be a transmitter of the virus causing this disease which is related to Russian spring summer encephalitis and louping ill, some outbreaks have been definitely traced to the consumption of raw goat's milk, the virus apparently being excreted in the milk of infected goats. Extensive studies of the biological cycle of the virus with special emphasis on its persistence in the tick vector are now under way

## FOOD AND DRUG PROBLEMS IN THE AMERICAS A CO OPERATIVE APPROACH\*

The need for the free flow of safe food stuffs to the consumer is obvious. It is perhaps less obvious though equally essential that drugs necessary for the health of the public should also be available through the channels of commerce subject to adequate but not superfluous safeguards. While drug control regulations are in force in most countries such difficulties as delays in processing applications for registration, obsolete technical requirements and restrictive packaging requirements—to mention only three—are all too frequent. Moreover official specifications vary from country to country.

Difficulties of this type have been a source of concern to governments, health authorities, the medical profession and the pharmacological and chemical professions for many years. Many of them arise from a lack of adequate technical information on the part of the licensing authorities in what has now become a most complex field—one moreover in which there is an acute shortage of trained technicians.

Although legislation on the safety, purity and potency of all food and drug products is the responsibility of each country, the problem is international in scope. Certain chemical preparations as well as a large number of foodstuffs have long been important items in international commerce but in recent years the market has been inundated with new pharmaceutical products, particularly antibiotics, most of which are produced in only a few countries. Their introduction into other countries may be hampered if importers and licensing authorities are unable to take safe and rapid decisions for lack of adequate information.

### Purpose of legislation

The main purpose of food and drug laws is to prevent the sale and distribution of unsafe, inadequate, adulterated or misleadingly branded products. In the United States, for example, the Federal Food, Drug and Cosmetic Act, the Federal Trade Commission Act and legislation in each State combine to ensure the sanitary protection of foods and patent drugs, the use of true weights and measures, the supervision of drug stores and adequate controls for meat and other farm products and for narcotic, poisonous and other dangerous drugs. Existing legislation in other countries has the same aims but is often less comprehensive. For this reason, some countries—especially certain of the smaller ones—have not yet been able to establish effective food and drug control services. Ideally, all such legislation should safeguard public health without imposing unnecessary restrictions on the movement and sale of goods.

### Activities of the United Nations, WHO and FAO

The United Nations and its specialized agencies have undertaken a number of important activities relating directly or indirectly to the control of food and drugs. A considerable degree of uniformity in legislation pertaining to narcotic drugs has already been achieved as a result of international conventions during the past half century and work in this field is being carried on by a United Nations Commission on Narcotic Drugs and a WHO Expert Committee on Addiction Producing Drugs. WHO has published the first International Pharmacopoeia prepared with the assistance of an expert committee and has convened Expert Committees on Biological Standardization.

and on Antibiotics. The Organization periodically issues lists of recommended international non proprietary names for pharmaceutical preparations with a view to obtaining their general recognition.

The Food and Agriculture Organization of the United Nations (FAO) disseminates data on food and nutrition and joint FAO/WHO committees have made recommendations on nutrition food additives and standards and techniques in respect of milk and meat hygiene.

Needless to say the work of these organizations has contributed towards a better understanding of food and drug problems throughout the world. To derive full benefit from this work however a country must have efficient food and drug services backed by appropriate legislation. This matter was among those discussed by a WHO Study Group on Specifications for Pharmaceutical Preparations which met in December 1956 to consider methods used for the examination of pharmaceutical products in various countries. Its report<sup>1</sup> includes suggestions for the organization of a national drug control service and outlines the principles to be followed in introducing new pharmaceutical products. In discussing international programmes the Group referred in particular to the studies which had been undertaken in this connexion in the Americas.

#### Activities in the Americas

In September 1957 a proposal for the gradual development of international co-operation on food and drug problems in the Americas was approved by the Directing Council of the Pan American Sanitary Organization (PASO) which serves as the WHO Regional Committee for the Americas. The Council also approved as a point of departure a general plan of procedure submitted by the Director of the Pan American Sanitary Bureau (PASB) the Organization's executive body.

The subject of the Council's decision was one that had been under consideration in the Americas for many years. Thus as long ago as 1923 the Fifth International Con-

ference of American States recommended the early adoption of internationally uniform food and drug legislation in order ultimately to obviate the necessity of analyses by importing countries. The following year the Seventh Pan American Sanitary Conference outlined basic principles for the proposed legislation but as the necessary funds were lacking no action was taken.

The matter was discussed again by the International Conference of American States in 1933 and by the Pan American Sanitary Conference in 1934 and 1938. Again no action was taken owing to lack of funds.

An exhaustive discussion on international food and drug regulations took place at the XIIIth Pan American Sanitary Conference in 1947. This time the Conference directed PASB to organize an international working unit and a group of experts composed of representatives of each American country. These bodies were assigned the overwhelming task of studying problems relating to the international distribution not only of food and drugs but of cosmetics as well and of preparing a bromatological code and a Pan American Pharmacopoeia. The Bureau's mandate in this connexion lapsed in 1950 however when the XIIIth Pan American Sanitary Conference relieved it of responsibility for implementing any resolution that had not been supported by an appropriation of funds.

Interest in the subject nevertheless continued, and the creation of an inter American agency for the control of drugs was proposed at the Second Pan American Congress of Pharmacy and Biochemistry in 1951. In 1955 a committee to study a Latin American food code was formed by the Latin American Chemical Congress and in the same year the Fourth General Assembly of the Pan American Medical Confederation passed a resolution designed to achieve the maximum possible uniformity of legislation on the inscription registration and distribution of pharmaceutical preparations in the countries of the Americas.

In June 1956 the PASO Executive Committee approved the proposal of the Pan American Medical Confederation in principle

and requested the Director of PASB to draw up a plan of procedure in consultation with the Pan American Union WHO and the International Union for the Protection of Industrial Property (which protects patents and proprietary names) As already mentioned, this plan of procedure was approved by the Directing Council of PASO in September 1957

### Plan of procedure

In view of the differing stages of development of food and drug control in the various countries and the number of interests involved in a problem which has medical public health economic and political aspects the Director of PASB was of the opinion that a careful and thorough survey of food and drug problems in each country was a prerequisite to international action The Council formally entrusted PASB with the responsibility for this survey which will be carried out during 1958

The Director suggested the following activities for eventual consideration

(a) the establishment of a clearing house financed by participating countries to provide to governments and through them to industry and interested groups information on food and drug laws regulations and practices in American countries (see below)

(b) the review and analysis of current legal requirements on the export import manufacture and supply of foods drugs cosmetics and therapeutic devices and the development of legislative standards on the registration of drugs and on other activities related to food and drugs for recommendation to governments

(c) the development within the framework of such standards as may be formulated by WHO of recommended standards of safety purity potency hygiene quality packaging etc of food and drugs

(d) the provision of expert advice and assistance on the development of national food and drug activities

(e) training programmes for national scientific technical and administrative personnel

including a fellowship programme to be undertaken in co operation with universities and food and drug agencies

(f) laboratory services for the development of standard laboratory methods testing (or reviewing national testing procedures) and reference

### International information centre

Referring to proposals for an international conference to consider uniform legislation on food and drugs the Director considered that such a conference would not be of any practical value until a solution had been found to the basic problem of making sound technical and scientific data available to all countries Authorities in several countries have already shown interest in the establishment of an inter American food and drug information centre on the lines of the Institute of Nutrition of Central America and Panama (INCAP) which is financed by quota contributions from member countries and assisted administratively by PASB

In the decade since its foundation INCAP has become one of the leading centres of its kind offering services which none of its member countries could afford individually Institutions such as INCAP and the Pan American Zoonoses Center at Azul Argentina which have the backing of a number of countries and one or more international organizations are a most efficient means of stimulating co ordinated action in certain fields The development of a similar institution to deal with food and drug problems in the Americas must however await the results of the survey now being undertaken by PASB

\* \* \*

Whatever is decided in the future the control of food and drugs will still remain the direct responsibility of the individual governments Nevertheless by promoting co operation between governments in this matter PASB can play a vital part in making safe foods and drugs more easily available in all the countries of the Region





"In the Americas it is noteworthy that since 1917 the Pan American Sanitary Organization has operated on a continent wide basis and since 1949 the programme of the World Health Organization in the Western Hemisphere and that of the Pan American Sanitary Organization separately financed by the nations of the Americas have been united as a single continental programme

The most important single development in public health in the Americas during the past decade is the rapid growth of international co-operation in the solution of the health problems of the Hemisphere and the constant improvement in the co-ordination of the activities of the several official participating agencies. The year 1958 finds the countries of the Americas committed to no less than four eradication programmes for the permanent elimination of smallpox, yaws, urban yellow fever and malaria from the continent. A decade ago only one of these eradication programmes, that for the eradication of the *Aedes aegypti* mosquito that transmits yellow fever, had been approved and the means were not then available for its execution. It is highly significant that the proposal for the eradication of yaws in Haiti first made in 1949 has been followed by several yaws eradication programmes in other parts of the world. Most significant of all is the increasing dedication of the nations of the world to the programme for the eradication of the world's leading killer of a decade ago, malaria.

As the first decade of the World Health Organization ends it is obvious that international collaboration in health has justified itself and has unlimited possibilities for the future. The countries of the Americas and of the world are learning better each year how to work together for the common good. It has long been recognized that disease knows no boundary. We are now learning that organization for health also can have no boundary."

Dr FRED L. SOFER, Director, Pan American Sanitary Bureau (WHO Regional Office for the Americas)

"Among the international organizations with responsibility for building a better world the World Health Organization ranks high. During its first ten years it has achieved some startling successes. For example in certain areas of the world endemic yaws has been eradicated by one injection of penicillin for each person

treated. Equally the cycle of malaria infection has been broken in many places by spraying homes and other buildings with insecticides, such as DDT, and in several regions malaria has already been eradicated. Such successes are encouraging.

"In the long run, however, an even more important task is to build strong health services everywhere, served by sufficient health centres and medical teams to make the general public health conscious.

The realization of this aim is not easy. In every country the same problems present themselves in different ways. As one disease is eradicated one problem solved others grow in importance. A longer life brings with it special problems connected with old age.

The lesson of the last ten years of health progress is nevertheless clear. Health for all is no longer an unattainable ideal but an everyday reality well within man's grasp.

Dr AXEL HOJER, former Director General Swedish Medical Board

Today social medicine is adopting new methods in the battle for health. One of the most important is early detection of disease while cure is still to some degree possible. During illness attention is also paid to the material situation of the patient and his family, and when he has recovered efforts are made to place him in employment which will not cause a relapse.

"The advent of social medicine has also transformed the role of the physician. Nowadays the treatment of a patient means more than simply performing an operation or writing a prescription. The physician must see the man as he is, the whole man; must watch for the innumerable signs that reveal the influence of his environment. The patient brings with him into the consulting room his family, his work, his surroundings—even his past and sometimes that of his forebears. He should be able to leave no possibility of his own future and that of his children as revealed to him by the physician.

The care of all aspects of the new humanism in medicine, the ever increasing attention paid to the man and not to the case."

Professor MARCIN KACPRZAK, Rector, Warsaw Medical Academy, Poland

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## *Microscopic classification*

The report concentrates on the histological grading of single atherosclerotic plaques a procedure which may be valuable in characterizing special cases. Only two kinds of arteries are considered those typified by the aorta and by the coronary arteries.

Histological changes found in the aorta include

(1) fibrin like film attached to the intimal surface or covered by endothelium

(2) metachromatically staining material (complex carbohydrates) increasing the intimal thickness

(3) lipid deposition either extracellularly or intracellularly (foam cells) in the form of droplets of variable size

(4) fibroplasia largely confined to the subendothelial portion of the intima in the form of mucopolysaccharides increased amount of reticulin collagen fibres and hyalinization

(5) calcification in fine or coarse granules

(6) cholesterol crystals finely granular amorphous glycoprotein material and ulceration

(7) vascularization extravasated red corpuscles haemosiderin and related by products

(8) medial changes such as lipid infiltration disintegration of smooth muscle fibres disruption of elastic fibres cellular infiltration around vasa vasorum and mucoprotein accumulation or alteration

(9) secondary changes such as thrombosis with its consequences

All these lesions can be found in the coronary arteries but additional significance should be attached to the presence of narrowing of the lumen and to large intramural haemorrhages

## *Special methods of grading*

Further research should be undertaken to determine the objectivity and practicability of certain procedures—based on physical

chemical or morphological characteristics—which might prove valuable in grading atherosclerotic lesions. Priority should be given to the development of methods for examining those arteries in which dysfunction is most liable to result from atherosclerosis notably the coronary and the cerebral arteries

The report suggests that the following techniques might be worthy of study and describes some of them briefly: measurement of the elasticity of the arteries; estimation of the consistency and viscosity of the elements of the arterial wall; radiography including the injection of radio opaque substances into the coronary artery system at various pressures; the use of image amplifier radiological techniques in the clinical demonstration of vascular lesions; and post mortem radiological examination of the arteries; cool dry methods in which the aorta is opened, stripped of its adventitia and outer medial coats stretched flat on a glass plate and left for 36-48 hours in a refrigerator with the result that the tissues become semi-transparent and reveal vascularization and haemorrhage of the intima and their relation to atherosclerotic plaques; use of electronic scanning and fluorescence to determine the extent of pathological constituents; morphological methods for which a combination of fixation at blood pressure levels and body temperature should be devised; simple chemical analysis; spectrographic methods for the estimation of trace elements; fluorescent immunochemical methods and histochemical techniques.

## *The problem of statistics*

The available statistics show marked geographical differences in mortality from cardiovascular disease in general and arteriosclerotic and degenerative heart disease in particular. However some of these differences are undoubtedly related to lack of medical facilities, incompleteness of registration and differences in the terminology used in classifying and certifying causes of death.

Pathologists should play an important role in certifying causes of death. In fact

it may be said that the value of mortality statistics is proportional to the frequency with which the cause of death is confirmed by autopsy findings. Death certificates should always indicate whether or not an autopsy has been performed.

The Study Group suggested that in the interests of improving statistics comparative studies of death certificates of different countries should be made with emphasis on promoting the use of the *International Classification of Diseases, Injuries and Causes of Death*. Where outstanding differences are noted the investigations may be extended by use of specific autopsy findings. The WHO Centre for the Classification of Diseases in London and the centre for Latin America in Caracas may be able to assist in these studies.

#### An international programme

The report outlines a programme for the pathological study of gross and histological lesions of atherosclerosis and for the develop-

ment of associated epidemiological investigations. It suggests that WHO should promote and co-ordinate this work and that the co-operation of international non governmental scientific organizations would be helpful.

Among other proposals is one for the establishment of an international centre for the study of lesions of atherosclerosis. Such a centre would draw its material from many sources—regional and national centres collaborating laboratories and institutions etc.—and after sufficient study would prepare and distribute suitable guides for the classification and grading of lesions. Eventually a network of centres might be developed and individual and team pilot studies might be initiated and co-ordinated.

Comparative medicine may be of some value in the study of atherosclerosis but the report warns that experimentally produced arterial lesions in animals present a complex of changes even more susceptible to misinterpretation than atherosclerotic lesions in man and that their relationship to atherosclerosis in man has in any case not been clearly established.

See Ch on H & H & Org 1957 11 374

## THE CONTROL OF BRUCELLOSIS

The Joint FAO WHO Expert Committee on Brucellosis met in October 1957 at Lima (Peru) immediately after the Fourth Inter-American Congress on Brucellosis. Some of the experts attending the Congress were invited to take part in two informal meetings of the Committee which was thus able to obtain the latest information on brucellosis problems and research in the Americas.

At the outset the Committee observed that since 1953 the date of its second report considerable advances had been made in knowledge of the biology of the human and animal forms of brucellosis as well as in their diagnosis and treatment (thanks in part to work done in the FAO WHO Brucellosis Centres). Encouraging results have also been obtained in practice: estimated losses from bovine brucellosis in the USA for example were reduced from \$100 million in 1947 to

\$40 million in 1957 and the success of the preventive measures taken in the Scandinavian countries, the Netherlands, the United Kingdom, the Union of South Africa and the USSR proves that control of this disease is now possible. These successes are all the more important in that as a source of human illness and of livestock losses brucellosis is still a major health and economic problem in certain parts of eastern Europe, Asia and the Americas.

The purpose of the third report of the Committee is not to provide yet another survey of the brucellosis problem as a whole but solely to point out changes which have taken place in the last five years in ideas concerning brucellosis and in its diagnosis.

J. FAO WHO Expert Committee on Brucellosis (1957)  
The 3rd report (WHO H & Org. Ann. Rep. Ser. N. 148) 51 pages  
Price: 3 s. 6d. 30 Sw. f. 2. Also published in French and Spanish.

and treatment. It should therefore be regarded as a supplement bringing the two previous reports<sup>2</sup> up to date.

### Brucellosis in man

The problem of the routes of transmission of the disease to man has on the whole been satisfactorily summarized in the Committee's earlier reports. However there is now increasing evidence that cheese made from unpasteurized milk is an important source of infection; furthermore numerous animal species—particularly the hare—which have been found to suffer from *Brucella* infections represent a possible reservoir of infection which it would be dangerous to ignore. Both these aspects of the problem call for special investigation.

Recent experience has shed new light on the value and advisability of certain methods of treatment, particularly the use of antibiotics. Generally speaking these substances shorten the duration of the disease considerably, reduce the number of fatal cases and are indicated in certain acute cases. However as they may have unpleasant side effects which can persist for weeks or even months after treatment has ceased and as moreover certain *Brucella* infections are of a mild nature antibiotics should be used with discretion and only in carefully selected cases. Since penicillin has proved ineffective against brucellosis use should be made of streptomycin or dihydrostreptomycin associated with sulfonamides or of the tetracyclines alone. So far the latter seem to have given excellent results and their use is recommended by the Committee. If the patient can tolerate the drugs then treatment should be continued for at least three weeks according to the schedule of dosage given in the report. In the case of certain patients who are seriously ill it has been found that administration of antibiotics can cause violent reactions, sometimes even a state of shock. An attempt has been made with some degree of success to prevent this reaction by the simultaneous administration of antibiotics and ACTH or corticosteroids; however the greatest care

should be taken in resorting to treatment with these hormones—termed potent drugs in the report.

In certain countries considerable use has been made of attenuated strains of viable bacteria and particularly *Br. abortus* strain 19 for the immunization of particularly exposed occupational groups. The method is said to have decreased the incidence of the disease; however the Committee had not sufficient information in its possession to arrive at definite conclusions on the value of this method.

### Brucellosis in animals

New knowledge concerning bovine brucellosis has led to a certain modification of the rules previously laid down for the interpretation of various diagnostic tests. As regards sero-agglutination tests it is recommended that the minimum diagnostic titre be now increased to 200 IU of antibody per ml of serum for animals of 30 months or older which have been vaccinated with strain 19 in the first few months of life. The Committee also recommends the standardization of antigens used for the milk ring test against the international standard anti *Brucella abortus* serum.

While the basic principles formulated in the first two reports are still valid, further experience in the field of bovine brucellosis has revealed certain new aspects of the problem. In the first place the collaboration of livestock owners is essential to the success of any measures contemplated—if owners are made conscious of their real interests and their support is obtained this will enormously facilitate the work of health teams. The organization of dynamic and effective information campaigns must henceforward be considered as a necessary adjunct to any well planned preventive action. Moreover it is well to remember that the aim of brucellosis control is the total eradication of the disease and not merely its regression. Programmes should always be drawn up and methods selected with this consideration in mind.

As concerns vaccines the superiority of *Br. abortus* strain 19 and its effectiveness for

the immunization of young cattle are now well established. Trials made in two countries show that a single dose of strain 19 inoculated between the sixth and eighth months of life immunizes cattle for seven years and makes revaccination practically unnecessary. Experiments carried out with reduced doses administered by different routes seem also to have produced satisfactory immunity. So far the data on this point are insufficient for exact determination of the optimal dose for every route of administration; however the optimal subcutaneous dose should never be less than 50-100 viable bacteria. When administered in good time strain 19 vaccine is an excellent means of prevention; on the other hand administration to adult cattle should be avoided as far as possible in order to prevent confusion between sero-agglutination titres due to the vaccines and those due to natural infection in subsequent tests.

Research on caprine brucellosis carried out in accordance with recommendations made in the previous reports has shown that this form of the disease also causes serious economic losses but is important chiefly because it is frequently transmitted to man. Prophylactic action in this field is hampered by the fact that the process of transmission of the disease between animals in the same herd is not entirely clear and because moreover the organism responsible *Brucella melitensis* is difficult to detect by the usual diagnostic tests. This uncertainty makes it necessary to consider as suspect all animals in a herd where a single case of infection has been confirmed and to isolate or even to slaughter them. The results obtained by this drastic method in France, Yugoslavia and Chile prove that in the long run it is the only way of ensuring total eradication.

The inadequate immunity against *Br. melitensis* conferred by the available vaccines and particularly strain 19 has made the control of caprine brucellosis still more difficult. However since the publication of the Committee's second report a series of new vaccines giving satisfactory protection has been developed: two vaccines consisting of killed *Br. melitensis* and a living attenuated

vaccine seem to offer special advantages. The Committee recommended that controlled experiments on several thousand animals be undertaken with these vaccines without delay.

Ovine brucellosis which has proved to be more widespread than was suspected may be caused by any of the three *Brucella* species. Nevertheless in regions where it is frequent its pathology resembles that of caprine brucellosis and the causal organism is usually *Br. melitensis*. Almost the same difficulties are encountered in the interpretation of diagnostic tests as in the case of caprine brucellosis; on the other hand prophylaxis seems to be easier since not only vaccines consisting of killed *Br. melitensis* but also strain 19 vaccines are said to have been effective. However this question needs to be more thoroughly investigated.

Finally there are many reports indicating that the incidence of porcine brucellosis is steadily increasing and that this zoonosis is now a major problem in certain countries. Consequently research on diagnostic tests suitable for this type of infection must be vigorously pursued.

#### Laboratory and research work

Part of the report is devoted to the interpretation and standardization of certain diagnostic tests and to methods for the isolation and identification of different *Brucella* species. The Committee paid special attention to the standardization of sero-agglutination tests basing itself on the recommendation made by the WHO Expert Committee on Biological Standardization in its seventh report<sup>3</sup> the Committee recommended in turn that in stating the results of this test mention be made of the number of IU/ml corresponding to the titre obtained since this notation has the advantage of facilitating comparison of data given by different methods. The Committee also noted the considerable progress made in the development of selective culture media. Finally it expressed the opinion that the new names given certain *Brucella* strains which because of their ambiguous nature cannot be classified in one of the three recognized categories were premature and

that the matter should be referred to the International Committee on Bacteriological Nomenclature

In conclusion the Committee again stressed the importance of the work done by the FAO/WHO Brucellosis Centres now numbering fifteen as well as by other specialized

laboratories which have been kind enough to co-operate. These institutions have greatly assisted eradication campaigns in various countries and their effectiveness is best shown by the fact that their activities have now diminished in certain regions where the brucellosis problem has practically disappeared

## Notes and News

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### Eye complications in protein malnutrition

The syndrome characterized chiefly by a dietary deficiency of protein and known by a variety of names—kwashiorkor, fatty liver disease, nutritional oedema and nutritional dystrophy to mention but a few—is prevalent among young children in most of the malnourished countries of the world. The clinical picture, however, is by no means the same in every detail in the various places where the syndrome is encountered. This is particularly true of the occurrence of eye lesions—an important complication often leading to loss of sight—that has not in the past always received sufficient attention from clinicians. While the reports of some investigators specifically mention the presence or absence of eye signs, those of others fail to comment on the state of the eyes.

An article on the involvement of the eyes in protein malnutrition will shortly appear in the *Bulletin of the World Health Organization*. The author—Dr D. S. McLaren of the East African Institute for Medical Research, Mwanza, Tanganyika—has made an extensive review of the literature, including the early as well as the more recent descriptions of the syndrome, and cites many instances of the association of eye changes with protein deficiency. It seems clear from this review, which covers all parts of the world, that the eye complications are due to an accompanying vitamin deficiency (of vitamin A in the case of the blinding conditions such as xerophthalmia and of the B-complex vitamins in the case of certain of the less

serious conditions) rather than to the lack of protein itself as has been suggested by some workers.

A striking report quoted by Dr McLaren—and one which lends very strong support to the vitamin deficiency theory—comes from Mexico City, where 450 out of 500 sufferers from protein malnutrition were found to present the diminished humidity of the conjunctiva that is characteristic of vitamin A deficiency. Further investigation of these 450 cases revealed that 78% had early xerosis, 7% had xerophthalmia, 12% had keratitis and 13% showed Bitot's spots, and that blood titres of vitamin A and crotonic acid were as low as 10–20 units per 100 grams were common.

Theoretically, there are several ways in which lack of protein may adversely affect the metabolism of vitamin A. For example, it may interfere with the absorption, storage or transport of the vitamin in the body or with the conversion of the provitamin, carotene, to the vitamin proper. Or again, it may be that a disordered protein metabolism in some way inhibits the function of vitamin A in cellular metabolism—a function about which very little is known except with regard to the retina. But the practical significance of these factors has yet to be discovered and, in Dr McLaren's opinion, a low dietary intake of vitamin A is likely to be the prime cause of the eye complications and making good the deficiency the best means of preventing them. To quote the concluding words of his article: "With

regard to therapeutic and prophylactic measures it seems probable from the work which has been done that even in the absence of gross physical signs the vitamin A stores are low in the protein malnourished child. Consequently correction of this should be part of any programme of treatment.

### Onchocerciasis control in the Sudan

The first internationally assisted programme for the control of onchocerciasis in Africa is shortly to be implemented in the Sudan. This disease is particularly wide spread in the two southern provinces of the Sudan, Equatoria and Bak-el Ghazal, where it bears the ominous name of "river blindness" owing to the immense number of cases of blindness and other serious ocular lesions for which it is responsible.

The problem has economic and social as well as public health aspects. The area in question is rich and full of economic promise on account of its abundant water-courses, but it is precisely along these water-courses which provide breeding places for *Simulium*, the vector of onchocerciasis, that the endemic foci of the disease are installed.

Although research workers of many nationalities including Sudanese have made very interesting studies of the local epidemiology of onchocerciasis, no real attack on the disease had formerly been made owing to the lack of the necessary practical facilities. However, now that techniques for the control of both parasites and vectors are available (as indicated in the report of the WHO Expert Committee on Onchocerciasis) the Sudanese Government has decided to undertake a campaign in collaboration with WHO for the abolition of this scourge which ravages two of the country's most fertile provinces.

After a study tour of the endemic zones in 1956 by Professor Giaquinto of WHO, a specialist in onchocerciasis, the Sudanese Government and WHO (the latter through its Eastern Mediterranean Regional Office) drew up a plan of operations.

The general plan includes measures for the control of parasites and their vectors in a

demonstration area and a preparatory epidemiological survey for the purpose of defining the most seriously affected areas. Control operations proper will begin in these areas and Sudanese personnel will be trained in the techniques used for the detection of the disease and its ocular complications and in treatment and control methods.

The epidemiological survey will be directed by Dr R. d. Haussy who went to the Sudan in March, on behalf of WHO, to assist the Sudanese Government in developing the programme. Dr d. Haussy was formerly Director of the Institute of Tropical Ophthalmology at Bamako in French West Africa and Professor of Tropical Ophthalmology at the Centre d'Instruction et de Recherches de l'Ecole d'Application, Marseilles. He has had wide experience of the difficult problems of ocular onchocerciasis which he has studied in all its aspects (epidemiological, clinical, therapeutic and histopathological).

### Japanese studies on insecticide resistance

A considerable amount of research on the problem of insecticide resistance has been carried out by Japanese scientists but owing to language difficulties much of it has not been easily accessible to scientists in other parts of the world.

In 1957 Dr A. W. A. Brown of the Division of Environmental Sanitation, WHO Headquarters, therefore visited Japan where in co-operation with Dr S. Takei and Dr S. Nagasawa, he assembled a collection of 36 papers by Japanese scientists either dealing directly with insecticide resistance or shedding light on the problem by examining the physiological effects of insecticides on various insects. This collection was translated into English and has now been published by the Institute of Insect Control, Kyoto University, under the title *Japanese Contributions to the Study of the Insecticide Resistance Problem*. A limited number of copies are available for distribution and may be obtained direct from the WHO Regional Office for the Western Pacific, P.O. Box 2932, Manila, Philippines.



## Malaria eradication in Jamaica and Mexico

Over 1 300 000 people in Jamaica—or 87% of the population—are exposed or subject to malaria and the disease is prevalent in an area covering nine tenths of the island.

Jamaica's health authorities are now taking action not merely to control malaria but to eradicate it. WHO and UNICEF are collaborating in this task.

Under the eradication plan prepared and approved in 1956 the Jamaican Government will spend some \$1 548 000 on a four year spraying campaign covering the entire malarious area. UNICEF's contribution amounts to \$529 000 while the Pan American Sanitary Bureau (which acts as the WHO Regional Office for the Americas) is providing three international malaria experts, anti-malaria drugs, vehicles and other imported equipment and supplies not furnished by UNICEF. The Bureau is also providing training through fellowships for the personnel employed in the eradication campaign.

Jamaica is divided into 13 parishes, each supervised by a medical officer. Before spraying geographical and epidemiological reconnaissance was carried out in each parish; this mapping operation was completed in December 1957. Conferences and seminars have been held for public health inspectors, supervisors and evaluators so that they may be able to secure the fullest co-operation from the public when the campaign is in progress.

Residual spraying operations began in January 1958. The supplies from UNICEF have been divided up among the parishes and there is also a central warehouse in Kingston. Houses in the malarious area of the island will be sprayed with dieldrin over a period of four years, after which surveillance measures will be established.

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Until recently Mexico had the biggest single malaria problem in the Americas, containing almost 65% of the population of the Region still unprotected against the disease. Some 17 000 000 Mexicans live in

the country's malarious areas where there were 2 000 000 malaria cases in 1954 alone and where the disease used to cause an estimated 20 000 deaths each year.

The campaign for the eradication of malaria in Mexico was officially initiated in December 1955 when an agreement was signed between the Mexican Government, the Pan American Sanitary Bureau and UNICEF. At the same time a presidential decree established the National Commission for the Eradication of Malaria, an autonomous organization for the planning and execution of the campaign. Even before these steps were taken, national and international personnel had made careful studies of all existing information about malaria in the country: its prevalence and the numbers of people to be protected and houses to be sprayed. Estimates had been made of the necessary materials and their cost and the general organizational structure of the eradication programme had been planned.

Work during 1956 was concentrated on the training of personnel, the geographical delimitation and reconnaissance of malarious areas, arrangements for the movement of supplies and equipment and steps to secure the co-operation of the public in the preparation of houses for spraying. Maps were made of over 40 000 localities and almost 3 000 000 houses were located and numbered. Data were also gathered on house construction, materials, roads and transport problems. More than 1 500 000 lb of DDT supplied by UNICEF were moved by ship to dry storage and thence to supply points for zones, sectors and field brigades.

Preliminary spraying began in September 1956; over 800 persons took part in this task, many of them travelling by horse, by boat or on foot into almost inaccessible areas. Full scale spraying began in January 1957 and will continue for four years.

Some idea of the extent of the campaign may be gained from the following figures. The Mexican authorities allocated nearly \$2 500 000 to the country's National Malaria Service in 1956. For the eradication campaign the Service employs a professional and technical staff of almost 400 persons, includ

ing 155 doctors. The number of field personnel employed exceeds 3000 and some 500 spraying squads are at work. The plan of operations for 1957 alone involved the spraying of 21 million houses twice during the year. Nearly 700 vehicles are being used in the campaign, including 200 jeeps and 415 pick up trucks. Some 1700 beasts of burden are used for transport purposes in areas where roads are unsuitable for vehicles. It is estimated that the campaign will cost approximately \$75 000 000.

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To date malaria eradication campaigns in the Americas have provided protection for more than 105 million people and they are expected to reach another 30 million people within the next few years. The aim is to achieve malaria eradication in the shortest possible time and before mosquitos can become resistant to residual insecticides. Campaigns could then be discontinued and the cost of malaria control would cease to be a burden on national health budgets. Moreover if eradication programmes are put into operation on a continuous basis over the next ten years it should be possible to prevent the recurrence of large scale epidemics.

#### Training of staff for malaria eradication

The need for suitably trained staff to give technical assistance to countries undertaking malaria eradication programmes has led to the organization of a WHO training scheme for malariologists. At the end of November 1957 the first batch of trainees—thirteen medical officers, most of whom had previous experience of tropical medicine—started a four week theoretical and laboratory course at the Ross Institute, London School of Hygiene and Tropical Medicine. This course was arranged with the co-operation of Professor George Macdonald. It was followed by two weeks of technical and administrative briefing in Geneva, after which the group left for four months training in Turkey and Iraq under the guidance of

Professor A. Coradetti, Dr M. E. Farinaud and Dr A. Gilroy. On completion of this field training the participants will return to Geneva and take an examination. The successful candidates will then be assigned to various malaria eradication projects.

A similar training scheme for entomologists was started by WHO at the beginning of March with a theoretical and laboratory course at the Institute of Tropical Hygiene and Geographical Pathology in Amsterdam. This will be followed by field training in Iran and East Africa. In addition arrangements are being made for the training of sanitarians and laboratory technicians.

The Pan American Sanitary Bureau (WHO Regional Office for the Americas) has also arranged training courses (in Spanish and English) for various categories of antimalaria personnel. The first English course was held in Guatemala at the end of 1957. A regular training centre with instruction in English has now been set up at Kingston, Jamaica, and several courses will be held there during 1958.

#### Control of venereal diseases

A WHO seminar on the control of venereal diseases was held in Tokyo from 17 to 29 March. The participants came from the following countries and territories in the Western Pacific Region: Australia, Cambodia, French Settlements in Oceania, Hong Kong, Japan, Korea, Laos, Singapore, Taiwan (China), Philippines and Viet Nam.

The purpose of the seminar was to review problems of venereal disease control in the countries of the Region and to seek effective ways of dealing with them. Particular attention was paid to the question of adapting the latest principles and methods of control to local circumstances. Among the topics discussed were the diagnosis, therapy and epidemiology of the venereal diseases, recommended methods for use in clinical practice and in mass campaigns, evaluation of the venereal disease problem and of control methods, the control of venereal diseases at ports and the role of certain population groups in the spread of these diseases.

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## Rural health team for Nigeria

WHO has sent a team to Nigeria to help the Government to develop a rural public health service. The service will provide training facilities for personnel taking part in Eastern Nigeria's expanding rural health programme. The team is composed of a public health administrator, a health inspector, a health visitor and a maternal and child health officer.

The public health administrator (and team leader) is Dr A. Spitz, who until recently was medical officer on a WHO public health and sanitation project in the Seychelles. Mr Parn Ganuman, the health inspector on tour, will join the team in May 1958. He is a graduate of the University of Beirut, and at present employed as regional sanitation with the Libya American Joint Public Health Service.

## Environmental sanitation in refugee camps

M. O. Konchady of India has been appointed by WHO to succeed M. C. Morse as Sanitation and Camp Maintenance Officer attached to the United Nations Relief and Works Agency (UNRWA) in Beirut. He will be responsible for the planning and technical supervision of environmental sanitation in the Agency's refugee camps. A graduate of Harvard and Johns Hopkins Universities, Mr Konchady is at present Professor of Public Health Engineering at Guindy College, Madras.

## Tuberculosis control in Viet Nam

A WHO medical officer—Dr Fazl Erhat—has gone to Saigon to assist the Government of Viet Nam in

its tuberculosis control work. A graduate of the University of Istanbul, Dr Erhat was Deputy Director of the Tuberculosis Control Centre in Turkey until recently. In 1953 he was awarded a WHO fellowship to study tuberculosis control in European countries.

## Fellowships for mental health workers

Four staff members of the National Mental Hospital in Mandaluyong, Philippines, have been awarded WHO fellowships for further study of mental health work at a hospital in Melbourne, Australia. They are Dr Carlos C. Vicente and Dr León da Dolorfino Mariano, senior resident psychiatrists, and Miss Teófila R. Aval and Mr Crispin N. V. Barbas, psychiatric nurses. They go up for Australia early in February.

These fellowships have been awarded as part of a programme of assistance to the Philippines National Mental Hospital by the WHO Regional Office for the Western Pacific. In addition, Dr Manuel M. Escudero has been assigned by WHO to help the Philippines Department of Health in developing its mental health activities, including the training of personnel.

## Regional appointments

Dr Francisco J. Dy has been appointed Director of Health Services in the WHO Regional Office for the Western Pacific. Prior to this appointment, Dr Dy was WHO Malaria Adviser for the Western Pacific Region.

Dr Gabriele Gramiccia has been appointed WHO Regional Malaria Adviser for Europe.



# INTERNATIONAL DIGEST OF HEALTH LEGISLATION

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## POLIOMYELITIS AND PUBLIC HEALTH

*The development of a vaccine effective against poliomyelitis has excited enormous interest throughout the world and large-scale vaccination programmes have already been carried through successfully in several countries. The experience gained can obviously be of benefit to public health authorities in other countries which are considering the introduction of vaccination programmes. To facilitate an international exchange of views on this subject the WHO Expert Committee on Poliomyelitis was convened in July 1957. Certain decisions of the Committee published in this report of the Committee dealing particularly with the public health aspects of the disease are summarized in this article below.*

### Epidemiology and vaccination campaigns

Before any country decides to introduce vaccination against poliomyelitis it must weigh the importance of its poliomyelitis problem against other urgent public health needs and judge what proportion of its resources can be made available for a vaccination programme. Its considerations will be influenced by the knowledge that the prevalence and severity of poliomyelitis differ greatly in different regions. In some it is a disease of infants only; in others it assumes epidemic proportions attacking both children and adults. Particular attention to the age incidence of paralytic poliomyelitis over the preceding decade will make it possible to determine the age groups mainly at risk. Having examined past experience an attempt should then be made to envisage how the situation is likely to develop in the future, particularly in those areas where reported cases have been few and epidemics unknown. However reassuring the situation may appear vigilance is called for since in many parts of the world poliomyelitis has recently tended to show a sharp increase in prevalence, sometimes in the form of severe epidemics. This change may be due partly to a general improvement in hygiene and sanitation, partly to the introduction of new and more virulent strains of virus. A fall in infant mortality may be considered as one of the

warning signs for it is common to find that when the infant mortality rate falls below about 75 per 1000 live births the poliomyelitis rates begin to increase above 3-4 per 100 000. A rise in the incidence of poliomyelitis especially in epidemic form, may also be heralded by the appearance of cases in older children as well as in infants. If the number of cases occurring in children over 10 years of age increases above 20% of the total there is every likelihood that the disease is increasing in activity. In order to be able to form a clear idea of the situation it is therefore important to maintain an efficient and accurate system of case reporting.

### Reporting and nomenclature of clinical poliomyelitis

The discovery that viruses other than that of poliomyelitis can cause a syndrome of "aseptic meningitis" has given further point to the recommendation put forward by the Third World Health Assembly in 1950 that paralytic cases should be reported separately. A revision in the nomenclature of the various clinical forms of poliomyelitis as proposed in the report of the Expert Committee would be desirable. In particular it is necessary to define what is meant by the term "non-paralytic poliomyelitis" which has been used indiscriminately in the past to denote a heterogeneous group of non-suppurative varieties of meningo-encephalomyelitis not always due to viral infections. During

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

against other diseases from persons already successfully immunized against poliomyelitis.

Certain observations suggest that tonsillectomies and adenoidectomies increase the risk of bulbar poliomyelitis probably by direct contamination of the nerves with poliovirus present in the pharynx. These operations have therefore been discouraged or forbidden during the "poliomyelitis season" in many communities. Since it is known that vaccination with inactive virus does not prevent multiplication of the virus in the intestine it is probable that it does not do so in the pharynx either. Accordingly the Committee recommended that until evidence to the contrary is accumulated it would be advisable to continue the prohibition of tonsillectomies and adenoidectomies during the "poliomyelitis season".

### Serological surveys

Serological surveys may furnish information that will be useful when a decision has to be taken regarding vaccination campaigns. Their intrinsic value is limited, however, and the time, labour and money which such surveys demand are not always justified. As far as possible, preference should be given to simpler procedures. Where reliable health statistics exist, providing data on the paralytic attack rate in different age groups over a period of one or more decades, a good picture can be obtained of the immunological status of the population. In areas where such data are not available, in island populations or other isolated communities and during epidemics presenting unusual features, serological surveys are indispensable. However, a knowledge of the immunological state of the population as revealed by statistics or by serological surveys does not in itself make it possible to assess the chances of an epidemic occurring or to gauge the resistance that the population would offer. It is necessary to take into account the virulence of the virus, the amount of virus in circulation in the population and other still imperfectly understood factors.

The results of some surveys already carried out were examined by the Committee and

found to be in harmony with current views on the epidemiology of poliomyelitis. It can be expected, for example, that few cases of paralysis will occur in a community if 80% or more of the population are immune as shown by the presence of poliomyelitis antibody. Nevertheless, the value of serological surveys is severely limited by the fact that the pattern of immunity varies among different socio-economic groups in the same country almost as much as it does among countries in widely different stages of economic development. As a means of assessing the immunological status of a population, serological surveys are in most cases a poor substitute for data accumulated by accurate reporting of the paralytic disease.

### Role of WHO

During the last few years, the six regional laboratories designated by WHO have had to expand their programmes of activity considerably and have received requests for assistance in many different fields.

#### *Professional training*

The Regional Laboratory for Europe has been concerned principally with demands for technical training. Courses in tissue culture techniques were organized in 1956 and 1957 and a further course will probably be needed in 1958. These training programmes, particularly those for short-term fellows, have imposed a heavy strain both on the Regional Laboratory for Europe and on the Regional Laboratory for the Americas. A short-term fellow is in fact able to contribute very little to the work of the laboratory, whereas a long-term fellow can play his part in the research and routine programmes which is both to his own advantage and to that of the laboratory. The number of short-term trainees in the regional laboratories will have to be limited—the more so as WHO fellows can find training facilities in other leading virus laboratories.

#### *Serological surveys*

Numerous demands have been received by some regional laboratories for assistance

epidemics of poliomyelitis as many as 80% of the cases of aseptic meningitis syndrome designated as non paralytic poliomyelitis may in fact be found to be caused by the poliovirus but at other times during the summer the percentage may fall to 5% and the majority of cases be found to be due to other organisms (Coxsackie A and B and ECHO viruses the viruses of mumps herpes and arthropod borne encephalitis leptospira etc.) For this reason the Committee suggests that the expression non paralytic poliomyelitis should be replaced by the term aseptic meningitis syndrome (due to virus) when the causal agent has been identified by laboratory tests or by the term aseptic meningitis syndrome (etiology unknown) if this is not the case. This syndrome is increasing in importance and large epidemics have already occurred it is therefore important that cases should be reported. The differential diagnosis of these various clinical forms is difficult without laboratory assistance. The provision of laboratory facilities is therefore indicated in areas where poliomyelitis constitutes a public health problem or is likely to become one.

### Selection of subjects for vaccination

It will be necessary to fix priorities within the age groups for which vaccination is considered desirable. As a rule first priority will be given to those sub groups that have shown the highest incidence of paralytic cases but an exception may be made when a relatively high percentage of cases of severe paralysis occur in other age groups for example in young adults.

### Vaccination during epidemics

Emergency vaccination campaigns have been initiated in some areas while an epidemic was in progress but the advantages and disadvantages of this procedure have not yet been fully assessed. While it is inevitable under such conditions that cases of poliomyelitis will be reported within a month of injection the majority of these are probably cases of natural infection independent of the

immunizing injection. Three other alternatives need consideration however.

- (a) provocation of a paralytic attack by the injection similar to the effect sometimes observed following the injection of various other antigenic materials particularly those containing alum
- (b) a heightened susceptibility lasting for a brief period after the injection enabling a coincident infection to have a greater paralytic effect
- (c) traces of virus may have escaped in activation

In general the advisability of starting a vaccination programme during the course of an epidemic will be decided by local circumstances. In a crowded community that has never been vaccinated the epidemic would probably have passed before the least advantage could be gained from the immunization. On the other hand where it is a question of preventing the extension of the epidemic to peripheral regions—a process that may take several months—it would seem advisable to institute vaccination on a large scale as early as possible.

### Provocation of poliomyelitis

The injection of certain immunizing agents containing alum—for example absorbed combined vaccines against diphtheria and whooping cough—has been found capable of provoking paralytic poliomyelitis in persons having an asymptomatic alimentary poliomyelitis infection.<sup>2</sup> The administration of such injections during epidemics of poliomyelitis has consequently been forbidden in many communities. Since it appears that provocation is due to the fact that poliovirus circulating in the blood becomes localized in the segment of the spinal cord corresponding to the site of the injection the Committee did not consider it likely that such accidents would occur in subjects who had completed a full course of injections of inactivated poliovirus vaccine. There would thus seem to be no reason for withholding vaccination

<sup>2</sup> I. Hsu, O. A. C. Cocks, M. W. C. (1958) *J. Hyg. Camb.* 80, 19 (in press). C. H. A. N. H. H. H. O. G. 1958

## VENEREAL-DISEASE CONTROL IN THE WESTERN PACIFIC

The first international venereal-disease control seminar ever to be organized by WHO in the Western Pacific Region took place in Tokyo Japan from 17 to 29 March 1958. There were 20 participants from 11 countries or territories within the Region (Australia Cambodia French Settlements in Oceania Hong Kong Japan Korea Laos Philippines Singapore Taiwan and Vietnam) in addition to WHO consultants and staff.

The seminar was officially opened by the Hon. Mr. Kenzo Honkai, Ministry of Health and Welfare for Japan. Dr. M. Yamaguchi, Director of the Bureau of Public Health of Japan, was elected President.

### Nature and extent of the problem

The Western Pacific Region covers a wide area stretching nearly from the Arctic to the Antarctic including many islands, archipelagos and peninsulas and embracing a diversity of languages, customs, religions and cultures. The approach to the problems of venereal disease control must therefore vary from place to place within the Region.

The first part of the seminar consisted of a discussion of reports from 11 countries and territories on the nature and extent of the venereal diseases in the Western Pacific Region. The statistics presented were based mainly on the numbers of new cases attending the governmental clinics and dispensaries. Their value therefore depended upon the adequacy of existing facilities, accuracy of diagnosis (especially in cases of genital ulcer) and conscientiousness in reporting. It was recognized however that where notification procedures are well established, statistics of this type are a useful guide to the incidence of the venereal diseases. Total venereal disease rates based on clinical incidence varied widely in the reports discussed.

ranging from 160 per 100 000 population in Japan to 870 per 100 000 in Singapore.

Other indices used to assess the extent of the problem included data on the prevalence of sero-reactivity in pregnant women and in certain population groups (armed forces, seafarers, entertainers, city employees, etc.). Such data are influenced by the quality, type and number of serum tests used by the age groups of the population tested and by selection factors in the material and have only a limited value in areas where an endemic treponematoses, e.g. yaws, is present. The value of the data presented on neonatal mortality and death rates due to syphilis was likewise dependent on accuracy of diagnosis and reporting.

Notwithstanding the limitations of the reported data, it was evident that the prevalence of syphilis has declined in several areas of the Region over the last ten years and that the disease is considered in some countries to be of less public health significance than previously, although it remains important in others. Examples of non-venereally acquired syphilis in children ("endemic syphilis") were reported from the islands of the South Pacific, while endemic yaws is prevalent in Cambodia, Laos, Malaya, the Pacific Islands and the Philippines. The downward trend of syphilis has not, on the other hand, been accompanied by a comparable fall in gonorrhoea, which remains a public health problem in most areas and in some has shown an upward trend in recent years. In at least one country, non-gonococcal urethritis has become more common than gonorrhoea in the male, though owing to its confusion with gonorrhoea, its prevalence is difficult to estimate. Chancroid has declined in many countries of the Region. Lymphogranuloma venereum is not uncommon but granuloma inguinale is relatively rare.

It was considered that the available information was insufficient to permit an accurate assessment of the true nature and

in carrying out serological surveys and such surveys have been very useful in areas where satisfactory health statistics are not available. The amount of information available on the immunity status of populations in different parts of the world is now so large however that serological surveys should only be undertaken with special well defined objectives in view.

#### *Supply of materials for diagnostic purposes and research*

The demands on the centres for antigens strains of virus specific antisera cells for tissue culture and tissue culture media have continually increased and have reached such proportions that it is impossible to satisfy them with existing resources. This is in fact part of a wider problem—that of the supply of diagnostic reagents for virus diseases in general. The commercial production of reliable reagents at a reasonable price is a problem that has not yet been solved and it was recommended that WHO should continue its efforts to find a solution.

#### *Technical advice and epidemiological studies*

Advice has been given and studies undertaken by the regional laboratories in connexion with severe epidemics in areas in which poliomyelitis has previously been rare or where there has been a sudden transition from the endemic to the epidemic form. In rendering these services the laboratories are fulfilling one of their essential functions. At the same time they serve as reference laboratories for confirming analyses and identifying viruses at the request of national laboratories. In order to avoid overlapping however the Committee suggested that a

single laboratory should be designated in each country which would be responsible for collecting specimens and requests for information and referring them to the regional laboratory.

#### *The study of enteric viruses—a task for the future*

International co operation is essential for the study of virus diseases resembling poliomyelitis but not caused by the poliovirus as well as for the study of those enteric viruses isolated from the faeces which do not cause poliomyelitis. The Committee therefore suggested that the regional laboratories and other leading laboratories should accept for further identification enteric viruses other than poliovirus responsible for epidemics of aseptic meningitis and other syndromes.

The reasons for the heightened virulence of the poliovirus and its increased ability to spread in man are among the principal unknown factors that prevent a thorough understanding of the poliomyelitis problem. As a means of discovering the characteristics of the virus responsible for these epidemiological features the study of viruses isolated during severe epidemics would be particularly important especially in the case of the first serious outbreaks observed in a country. It would be the task of the regional laboratories to arrange for the collection of these viruses in the areas they serve and to make them available on request to the research laboratories. This would apply also to viruses isolated from cases of paralytic disease in vaccinated persons which might be due either to the emergence of serologically variant strains of poliovirus or to other viruses able to cause paralytic disease.

control of infectiousness in all cases and cure in a high proportion of them, even when patients fail to return for further treatment. It was remarked that many clinics give dosages in excess of those recommended by the Committee.

The seminar recognized that preparations of PAM<sup>2</sup> should conform with the minimum requirements formulated by WHO so that unnecessary relapses can be avoided and the results of treatment by the brands employed in different countries can be compared.

### *Gonorrhoea*

While the numbers of cases of gonorrhoea in many countries of the world have fallen to as much as 30-50% of the immediate post-war peak, there are now signs not only that the decline has halted, but that the disease is definitely on the increase in certain areas. This trend has been reported outside the Region in Canada, Denmark, Finland, France, India, Poland, Norway, Sweden, the United Kingdom and the USA. Information presented to the seminar showed that a similar situation exists in Australia, Hong Kong, the Philippines, Singapore and Taiwan. It is evident that gonorrhoea is far from being controlled and represents a considerable and increasing problem.

**Diagnosis.** The methods used in the diagnosis of gonorrhoea vary throughout the Region. The importance of distinguishing the disease from non-gonococcal urethritis in males was stressed, since the latter condition is relatively insensitive to penicillin. Thus, in the event of a wrong diagnosis, the failure of the discharge to clear following the use of penicillin might result in an unfair appraisal of the value of this antibiotic in the treatment of gonorrhoea. The value of cultures for diagnosis of the disease, especially in females, and the need for standardized methods were also stressed.

**Treatment.** Evidence was presented to show that repository penicillins are no longer as effective as they have been in the treatment of gonorrhoea, although it was agreed that

complications of the disease are rare. The higher failure rates—up to 30% in some series—have occurred in spite of a gradually increasing dosage.

It appears that the gonococcus is becoming less sensitive to penicillin. It is not known whether this is due to the development of new metabolic processes in the organism (i.e. acquired resistance) or whether—as seems more likely—it is a result of the continued selective breeding of relatively insensitive strains.

Possible ways of dealing with the situation were discussed, and the view was expressed that even if penicillin is only 70% effective in the treatment of gonorrhoea, it is still an excellent drug for the purpose. The tetracycline and other antibiotics administered orally are too expensive for routine use and, if used on a wide scale over a period of time, might also gradually become less effective. This applies to streptomycin as well.

It was felt, however, that in order to prevent the gonococcus from developing a lessened sensitivity to penicillin by easy stages, a higher level of penicillinaemia is required than that obtained with doses of up to 1.2 mega units of the long-acting benzathine penicillin or of PAM. The difficulty if a short-acting preparation is used would be the loss of the so-called "epidemiological tail" (the prolongation of penicillinaemia for some days during which the contacts may be found and treated before the original patient becomes reinfected). The seminar suggested that the question of the dosage and preparation to be used for the treatment of gonorrhoea be urgently reviewed by the WHO Expert Committee on Venereal Infections and Treponematoses. In the meantime, the continued use of repository penicillins (e.g. PAM) in gonorrhoea would seem to be justified only as long as the cure rates remain acceptable, while in most areas the dose of penicillin, whatever the preparation in current use, might with advantage be substantially increased to prevent further loss of sensitivity.

The importance of research into the apparent lessening of sensitivity in the

<sup>2</sup>Procaine penicillin 6 to 12 i.u. 2-4 times daily.



extent of the venereal diseases in the Western Pacific Region. In Japan special one day survey techniques have shown that venereal infections in some areas were six to ten times more frequent than reported data had indicated.

The seminar considered it desirable to obtain further data on the nature and extent of the problem and recommended that WHO explore with health administrations in the Western Pacific Region the possibility of carrying out venereal disease surveys suited to the widely differing local conditions and circumstances. Such surveys would be helpful in determining the lines along which future control programmes should be planned. It was particularly recommended that antenatal serum testing for syphilis be applied on the widest possible scale in the countries of the Region taking into account the limitations of this procedure in areas where endemic treponematoses (yaws) is present. Antenatal serum testing serves a quadruple function. In addition to providing a useful index of syphilis prevalence it is a valuable case finding mechanism in a sexually active group, enables congenital syphilis to be prevented by the administration of penicillin to the women tested and provides a useful starting point for family contact investigation.

## Diagnosis therapy and control

### *Syphilis*

**Diagnosis** For the diagnosis of syphilis the fundamental procedures are the dark field examination in cases of genital sore and serum tests. It was evident that standards of diagnostic procedure vary widely throughout the Region.

Dark field examination is of particular importance in many countries of the Western Pacific Region where chancroid and other genital sores are relatively common in comparison with syphilis (chancroid was reported to be seven times more common than primary syphilis in Taiwan and four times more common in Laos). If reliance is placed on clinical examination alone, not only are cases of syphilis missed but cases of chancroid in persons with a positive serology due to late

latent syphilis or to yaws are frequently incorrectly diagnosed as primary syphilis and their treatment with penicillin may be written off as a failure when serological reversal fails to occur. The seminar considered that when possible dark field examinations—repeated if necessary—should be carried out for all cases of genital sore.

Serum tests are best performed in the laboratory. A few well equipped laboratories are preferable to several small ones since they ensure greater uniformity in the methods employed. International reference preparations for cardiolipin and lecithin and dried reactive sera are now available through WHO. The seminar welcomed this development which permits the standardization of local reagents and methods. It recognized that, for the appraisal of penicillin therapy in syphilis quantitative serological techniques are necessary and that local serological laboratories should depend on a central reference laboratory where results can be checked and verified.

The problems created by false positive findings were considered and the newer serological techniques involving treponemal antigens (treponemal immobilization test, treponemal agglutination test and treponemal complement fixation test) were reviewed. It was agreed that laboratories should not press for these valuable tools until basic national serological services employing the conventional tests have been firmly established. On the other hand the seminar recognized the continuing need in the Western Pacific Region for an international serological centre which could be at the disposal of national laboratories and where the newer tests would be available.

**Treatment** Long acting penicillins were agreed to be the preparations of choice for the treatment of syphilis and the minimal schedules recommended by the WHO Expert Committee on Venereal Infections and Treponematoses were noted<sup>1</sup>. The high initial dosage recommended is important from an epidemiological and public health point of view since it ensures the rapid

probable that some of the 9 deaths reported in the WHO survey could likewise have been avoided

The majority of the deaths reported by participants had occurred during private treatment by general practitioners (who use quicker acting penicillins more frequently). A number of participants stated that, in spite of the many thousands of injections of penicillin for which they had personally been responsible over periods of up to fifteen years they had not themselves encountered any deaths from penicillin anaphylaxis. Therefore while the seriousness of allergic reactions to penicillin should not be minimized fear of such reactions should not be allowed to interfere with the full application of penicillin in treponematoses-control programmes

#### *Prevention*

The seminar recommended that all possible measures be taken to prevent the occurrence of reactions to penicillin by forbidding the sale of the drug except on prescription and permitting its use only when indicated on recognized clinical and public health grounds. Topical applications of the antibiotic and its use for trivial conditions should be discouraged

It was felt that many penicillin reactions could probably be avoided by careful history taking regarding previous allergic reactions especially to penicillin. The value of skin sensitivity tests was considered to be limited although they are used in some countries

Some fatalities could be avoided by having resuscitating drugs available for immediate use and it was considered that special resuscitating kits should be held in readiness in all centres and surgeries where penicillin is given. A working party set up by the seminar considered that these kits should contain the following drugs: adrenalin hydrochloride 1:1000, nikethamide, an anti-histamine preparation for intramuscular injection and two 2 ml syringes with hypodermic needles. If locally available a suitable cortisone preparation—to be given intramuscularly or intravenously—and aminophylline (up to 0.5 g) for slow intravenous

injection should be provided. It was noted that penicillinase has recently become available commercially and it was felt that this preparation might be useful in the future

It was recommended that immediately a patient shows a reaction he should be laid flat and 0.3–1.0 ml (5–15 minims) of adrenalin hydrochloride should be administered in the upper arm followed by 2.0 ml of nikethamide. If the patient's condition fails to improve or deteriorates the adrenalin should be repeated or a suitable cortisone preparation given intramuscularly or intravenously. Other recognized therapy for severe shock should be instituted and where possible the patient should be admitted to hospital. Intravenous or intramuscular antihistamine preparations should be given in cases of angioneurotic oedema and 0.5 g of aminophylline intravenously when coughing and respiratory distress are marked

#### *Venereal-disease prevention and control*

Effective venereal disease prevention and control depend on the availability of free and adequate facilities for diagnosis and treatment. The use of these facilities should be encouraged in the course of case finding through contact tracing and health education work among certain groups of the population particularly expectant mothers. It was noted however that in the Western Pacific Region antenatal serum testing is in many instances limited and that by no means all expectant mothers have the opportunity of receiving antenatal serum tests

#### *Maritime aspects*

Venereal diseases are often diseases of itinerants especially seafarers and therefore constitute a particular problem in seaports where they are usually linked with prostitution. The mutually protective Brussels Agreement of 1924 (administered by WHO since 1948)<sup>2</sup> provides for free treatment of seamen of all nationalities in port areas. The seminar noted that there are still some countries in the Western Pacific Region and elsewhere which have neither ratified nor

gonococcus was stressed as was the need for seeking improved methods for the diagnosis of gonorrhoea. The seminar recommended that an international gonococcus centre be established to examine these and similar problems.

*Ophthalmia neonatorum* It was noted that ophthalmia neonatorum is encountered in some parts of the Region and that further work in this field in co-operation with maternal and child health programmes appears to be necessary.

#### *Non gonococcal urethritis*

In some areas non gonococcal urethritis is frequently confused with gonorrhoea. In Japan it is assuming greater importance than gonorrhoea in the male. Its etiology is unknown and its treatment unsatisfactory. The tetracycline antibiotics which apparently give the best results are very expensive. The seminar considered that further special research in this field is required.

#### *Other venereal diseases*

Of the diseases in the chancroid lymphogranuloma venereum and granuloma venereum group it was agreed that chancroid is the most important in the Western Pacific Region. Although the incidence of this disease in relation to that of primary syphilis was reported to be on the decline in Taiwan Japan Hong Kong the Philippines and Viet Nam it represents a considerable problem in many areas. This disease by itself is usually amenable to sulfonamides but the diagnostic methods all have their limitations. It was agreed that the most important step in its control is to exclude the possibility of syphilis by dark field and serum tests which should be repeated if necessary. If local conditions preclude the proper exclusion of syphilis suspected cases of chancroid are best treated with penicillin administered as for syphilis with sulfonamides in addition if necessary. It was evident that lymphogranuloma venereum is present throughout the Region but that in most parts it does not represent a public health problem. Granuloma inguinale

is rare (less than 0.1 per 100 000 population in Japan). The high incidence of condylomata acuminata among prostitutes in Taiwan was noted.

#### *Penicillin reactions*

##### *Nature and extent*

Severe anaphylactic reactions following the use of penicillin have occurred in recent years in many countries including those of the Western Pacific Region.

Allergic reactions to penicillin are usually related to a previous history of allergy to the number of injections previously given to the intervals between them and to the type of preparation used. They are more common with certain types of penicillin with quickly absorbed rather than repository preparations and with any penicillin preparation which has been in use for some time. They appear more frequently after intramuscular administration than after oral administration and are less common in children who are likely to be receiving penicillin for the first time.

All the participants were aware of some fatalities due to penicillin. The publicity given to such cases—particularly if the victim is well known in a community—tends to create alarm and can jeopardize the success of a whole treponematoses-control campaign.

Serious reactions in the course of treatment for venereal disease are however extremely rare in relation to the enormous amounts of penicillin used—and in general much rarer than they were in the days when arsenic and bismuth were employed. A recent WHO survey involving some 626 500 patients treated with repository penicillin in 18 countries over a five year period revealed only 9 deaths—or one in 70 000 cases treated. In Taiwan which reported the largest number of deaths following the administration of penicillin only 1 death had occurred in 44 000 cases treated during the WHO assisted venereal disease control project. It was stated that this fatal case could probably have been avoided if there had been a known history of previous penicillin allergy. It is

probable that some of the 9 deaths reported in the WHO survey could likewise have been avoided

The majority of the deaths reported by participants had occurred during private treatment by general practitioners (who use quicker acting penicillins more frequently). A number of participants stated that in spite of the many thousands of injections of penicillin for which they had personally been responsible over periods of up to fifteen years they had not themselves encountered any deaths from penicillin anaphylaxis. Therefore while the seriousness of allergic reactions to penicillin should not be minimized fear of such reactions should not be allowed to interfere with the full application of penicillin in treponematosis-control programmes

### *Prevention*

The seminar recommended that all possible measures be taken to prevent the occurrence of reactions to penicillin by forbidding the sale of the drug except on prescription and permitting its use only when indicated on recognized clinical and public health grounds. Topical applications of the antibiotic and its use for trivial conditions should be discouraged

It was felt that many penicillin reactions could probably be avoided by careful history taking regarding previous allergic reactions especially to penicillin. The value of skin sensitivity tests was considered to be limited although they are used in some countries

Some fatalities could be avoided by having resuscitating drugs available for immediate use and it was considered that special resuscitating kits should be held in readiness in all centres and surgeries where penicillin is given. A working party set up by the seminar considered that these kits should contain the following drugs: adrenalin hydrochloride 1:1000, nikethamide, an antihistamine preparation for intramuscular injection and two 2 ml syringes with hypodermic needles. If locally available a suitable cortisone preparation—to be given intramuscularly or intravenously—and aminophylline (up to 0.5 g) for slow intravenous

injection should be provided. It was noted that penicillinase has recently become available commercially and it was felt that this preparation might be useful in the future

It was recommended that immediately a patient shows a reaction he should be laid flat and 0.3–1.0 ml (5–15 minims) of adrenalin hydrochloride should be administered in the upper arm followed by 2.0 ml of nikethamide. If the patient's condition fails to improve or deteriorates the adrenalin should be repeated or a suitable cortisone preparation given intramuscularly or intravenously. Other recognized therapy for severe shock should be instituted and where possible the patient should be admitted to hospital. Intravenous or intramuscular antihistamine preparations should be given in cases of angioneurotic oedema and 0.5 g of aminophylline intravenously when coughing and respiratory distress are marked

### *Veneral-disease prevention and control*

Effective venereal disease prevention and control depend on the availability of free and adequate facilities for diagnosis and treatment. The use of these facilities should be encouraged in the course of case finding through contact tracing and health education work among certain groups of the population particularly expectant mothers. It was noted however that in the Western Pacific Region antenatal serum testing is in many instances limited and that by no means all expectant mothers have the opportunity of receiving antenatal serum tests

### *Maritime aspects*

Veneral diseases are often diseases of itinerants especially seafarers and therefore constitute a particular problem in seaports where they are usually linked with prostitution. The mutually protective Brussels Agreement of 1924 (administered by WHO since 1948)<sup>2</sup> provides for free treatment of seamen of all nationalities in port areas. The seminar noted that there are still some countries in the Western Pacific Region and elsewhere which have neither ratified nor

adhered to the Brussels Agreement and it considered that they should be encouraged to do so as recommended by WHO in 1954. At the same time it was felt that the addresses and hours of venereal disease clinics in countries which have not so far adhered to the Brussels Agreement should be included in the *International Directory of Venereal Disease Treatment Centres at Ports* a new version of which is now being prepared by WHO.

### *Prostitution*

No country has yet succeeded in suppressing prostitution completely. Social reform has led to the legal abolition of brothels in many countries and this measure has in the long run tended to reduce the incidence of venereal diseases. The seminar considered that action against prostitution is a social rather than a medical matter but that the control of the venereal diseases among prostitutes and their consorts is part of the accepted responsibility of health administrations.

It was noted that the situation in certain Western Pacific countries differs from that in many other parts of the world in so far as 70-90% of venereal disease cases are reported as being contracted from prostitutes, 12-35% of whom are infected with syphilis or gonorrhoea or both.

The routine medical examination of prostitutes was considered in detail. It was realized that such examinations have their limitations but cannot be discarded as valueless. The routine prophylaxis of prostitutes with penicillin was also discussed. The evidence indicated that it confers a large measure of protection against syphilis but the data concerning gonorrhoea were less encouraging. The principal disadvantage appeared to be the possibility of reducing the sensitivity of the gonococcus to penicillin. Moreover only a relatively small

fraction of the prostitute population is usually covered by routine prophylaxis. The difficulty of evaluating the effects of this measure and the need for assembling all available data on the subject both from the Region and elsewhere were stressed.

The participants in the seminar were particularly interested in a report from Japan of a new prophylactic procedure which has been tried out over the past few years. This involves the insertion of penicillin or another antibiotic deep into the vagina after vaginal irrigation following the last sexual intercourse each night. Laboratory tests have shown significant concentrations of penicillin in the vaginal fornix and to a lesser extent at the uterine orifice 24 hours later. The data presented indicated that by this method the incidence of both gonorrhoea and syphilis in prostitutes might be significantly reduced.

The seminar considered at some length the possible consequences for venereal disease control of the abolition of brothels. This question was of particular interest to the host country Japan where a new Anti Prostitution Law making brothels illegal came into force on 1 April 1958 a few days after the close of the seminar. Experience in other countries has shown that in such circumstances clandestine prostitution tends to increase and a wider outlook on the question of venereal disease control is necessary.

The first essential as recommended by the seminar is the provision of free and confidential treatment which should be easily available to all and the use of which should be encouraged by health education at all levels. Epidemiological case finding is also essential while venereal disease in the community should be uncovered as far as possible by screening procedures (e.g. ante natal blood testing and the blood testing of special groups).

## PROBLEMS AND PROSPECTS OF MALARIA CONTROL IN WEST AFRICA

In the tropical areas of West Africa the intensity of malaria transmission is probably greater than anywhere else in the world. Consequently more efficient methods have to be adopted to break the cycle of transmission. Attention has recently been drawn to new problems which increase the complexity of malaria control in the area. These include resistance of the vectors to insecticides, resistance of the malaria parasite to pyrimethamine, sorption of the insecticides on mud walls and outdoor resting habits (exophily) of the vectors enabling them to escape the action of the insecticides.

Faced with these difficulties and with the failure of man, of the malaria control projects in the area, the WHO Regional Office for Africa called together a technical conference at Brazzaville from 19 to 22 November 1957 to enquire into the reasons for the failures and to consider ways of improving the efficiency of the measures employed. The conference was attended by malariologists and entomologists from all parts of West Africa as well as by members of the WHO staff and representatives of the US International Co-operation Administration and UNICEF. The following is a summary of the discussions.<sup>1</sup>

### Importance of environment

As a preliminary to the main debates the participants reported on the progress of malaria control in the various territories represented. The differences revealed were highly informative. In the South Cameroons, for example, the vectors have disappeared completely from human habitations and in many areas it appears that transmission has been interrupted. On the other hand in the Upper Volta infected *Anopheles* have been found throughout the sprayed area and no significant difference has been observed

between the larval populations of sprayed and unsprayed areas. The explanation of this contrasting behaviour is twofold:

(i) The South Cameroons is mainly forest land whereas the Upper Volta is a savannah area with scattered trees and shrubs.

(ii) The inhabitants of the South Cameroons spend the whole year in the same huts, sleep inside at all seasons and retire early at night. In the Upper Volta the inhabitants live in "crop huts" away from the village during the planting and harvest season and they sleep outside their houses for part of the night, especially during the dry season.

In both areas the vectors—of which *A. gambiae* is the most important—are anthropophilic and bite for preference in doors, but they also bite readily in the open at night. In the South Cameroons, however, the habits of the population deny them this possibility and the scarcity of domestic and wild animals means that there is practically no alternative source of food. In the Upper Volta the mosquitos are able to feed outside at night and there are also large numbers of domestic and wild animals. The fact that during the season of maximal transmission the inhabitants live in "crop huts" which are often only temporary buildings also increases the difficulties of control. Added to this the savannah-like nature of the Upper Volta, with several large rivers and many marshes and temporary pools during the rainy season, offers plenty of favourable breeding places for the mosquitos away from the treated areas. *A. gambiae* in particular prefers sunlit water and for this reason is able to breed in the South Cameroons only in the vicinity of the villages where the forest has been cleared.

Similar conditions to those in the Upper Volta are found in the savannah country of the North Cameroons where little progress

<sup>1</sup>Based on unpublished working documents WHO/Mal/196

has been achieved. Results have also been disappointing in Liberia where the majority of the population lives in remote scattered dwellings and in Togoland where the spraying teams had difficulty in gaining access to many buildings especially to fetish huts. In both territories the population spends the agricultural season which coincides with the peak of malaria transmission in crop huts. On the other hand substantial control of the vectors has been achieved in Senegal and Northern Nigeria, where malaria rates have been greatly reduced. Interruption of transmission has not yet been achieved however although insecticide spraying has been carried out since 1953 and 1954 respectively.

These differences emphasize the important influence that the ecological environment and the way of life of the population may have on the outcome of spraying operations.

### Spraying campaigns

Shortage of funds has led to the practice in some territories of using long acting insecticides and of disbanding the labour force at the end of each season in order to reduce the costs of the project. This practice was strongly criticized by participants in the conference: once an experienced team has been built up it should be kept in existence from year to year.

To ensure maximum efficiency strict supervision of the work of spray teams is necessary. While this can usually be achieved in highly populated areas where the project staff work together in groups of considerable size it is much more difficult to realize in areas where small spray groups operate over a wide area. Good personnel to act as squad leaders are difficult to find in West Africa; it is therefore important that the duties of these men should be carefully planned so that the best possible use is made of them. Suggestions on methods and techniques for the training of spraymen using compression sprayers are included as an annex to the report. The preparation of a similar guide to the training of supervisory staff is in hand.

Another annex to the report shows specimens of the WHO forms for reporting

spraying operations. These forms which are designed to include only essential data have already proved their value in different parts of the world and their adoption in West Africa was recommended by the conference.

When carrying out spraying it is important to ensure that an effective dose of insecticide is deposited on all surfaces within a house including the furniture as well as the walls, ceilings and roof. It was agreed that all outside houses and the house eaves should also be sprayed. There is a need for field research to determine the most effective method of spraying high ceilings and the apex of cone shaped roofs. In some territories double roofs present an additional complication. A demonstration of spray pumps was given to the conference and the advantages and disadvantages of the different types in common use were discussed. Some recommendations concerning the purchase and maintenance of spraying equipment are given in an annex to the report.

The success of a spraying campaign is dependent among other factors on the availability of adequate transport in good running order. It was considered that while drivers in West Africa should be instructed in simple daily maintenance they should not be expected to carry out repairs in the field. In large control campaigns a mobile repair truck with a competent staff could serve a number of spraying teams and effect field repairs of considerable magnitude. For major repairs however vehicles should be returned to a well equipped and adequately staffed main base. When purchasing vehicles consideration should be given to the availability of spare parts in the territory in which they would operate.

### Choice of insecticide

In view of the development of resistance to dieldrin and BHC in several of the territories the conference recommended that neither of these insecticides should be used in new projects in West Africa unless their use was justified by special circumstances. Generally speaking the choice of insecticide should be governed by the presence or absence of resistance. When resistance develops a

change of insecticide is often a matter of urgency and it was therefore suggested that a central depot holding stocks of an alternative insecticide should be created to serve a group of territories. If no calls were made on these emergency stocks in any one year they should be distributed to territories using the insecticide concerned and replaced by fresh supplies. It was requested that UNICEF should consider participation in such a scheme in the future.

### Pilot testing zones

The evidence presented to the conference shows that more than three years of spraying with various residual insecticides in West Africa has not succeeded in preventing the occurrence of new malaria infections except perhaps at high altitudes and in some forest areas of the South Cameroons. These results clearly indicate the need for instituting an adequate programme of research both before and during the application of control measures. Great emphasis was laid on the importance of creating pilot testing zones which would serve to test different methods and form the basis for the planning of the main scheme. Such pilot projects would have to be flexible in order to answer the question

How can malaria transmission be interrupted under local conditions? They would give early warning of the failure of any method and would indicate any modifications that might be required in the main project. The questions which need urgent study include rate of inactivation of insecticide on sprayed surfaces, behaviour of the vector in relation to sprayed houses (observations should be made in sprayed and unsprayed experimental huts) and periodic assessment of the degree of susceptibility of the vectors to the insecticide. In some areas the possibility that "secondary vectors" may be an important cause of transmission also needs investigation. Where staff and facilities are adequate it would be useful to study the effect of insecticide applications on the age composition of *A. gambiae* and such changes as selection of resistance or enhancement of vigour. The conference discussed the setting

up and duties of an entomological survey team and outlined a minimum programme of research. It was emphasized that no amount of intensified research after spraying had started could ever replace a lack of pre-control data.

### Mass chemoprophylaxis

In territories where the interruption of malaria transmission could not be achieved by house-spraying of residual insecticides alone there is hope of achieving malaria eradication by a combination of insecticide control with an auxiliary measure such as mass treatment of the population with antimalaria drugs. In certain of the pilot testing zones groups of not less than 20 000 persons should be submitted to mass drug treatment at first with and later without insecticide protection. The drugs to be tried are pyrimethamine and chloroquine or possibly a combination of the two. Some preliminary results in Nigeria, Senegal and Gambia were reported to the conference. Although it is still too early to make a proper assessment of these trials the results appear on the whole to be encouraging. Much work remains to be done however to determine the best methods of administration and the amount of supervision required in West African territories. Pinotti's method of distributing the drug in a universally consumed foodstuff such as salt, offers one possibility. In certain areas of West Africa salt is supplied from many sources and it was suggested that any attempt to replace these many sources by a single one would be likely to arouse the mistrust of the inhabitants. Funds have already been set aside by WHO however for a trial to be carried out to determine whether Pinotti's method could be successfully applied in West Africa.

### The final goal: eradication

Although in the light of present knowledge it is not possible to contemplate malaria eradication in West Africa the conference believed that the time would eventually come when it would be necessary to make plans to



link up with eradication schemes elsewhere in the continent. Progress in this direction could only be achieved by intensified research co-ordination of effort and free exchange of information among West African territories. The conference stressed the value of periodic meetings of research workers and field staff, the award of travelling fellowships and assistance in the training of auxiliary staff. It was recommended that the relevant authorities should consider whether the introduction of special malaria legislation

might increase the efficiency of control especially in territories where operations are hampered by lack of co-operation on the part of the local population. Finally the conference recommended that the provision of staff laboratory facilities, equipment and transport should be on a much greater scale than is regarded as normal in other regions and that the use of these facilities should be strictly confined to investigations bearing on the two main problems of man-mosquito and mosquito-toxicant interaction.

## ERADICATION OF ONCHOCERCIASIS VECTOR FROM KENYA

The virtual eradication of *Simulium neavei*, the vector of onchocerciasis in Kenya, is reported in a paper by J. P. McMahon, R. B. Highton and H. Goins, which will shortly be published in the *Bulletin of the World Health Organization*. This has been made possible by the discovery in 1950 that the early stages of *S. neavei* are always found attached to the freshwater crab *Potamonautes niloticus* in what appears to be phoretic association<sup>1</sup>. The larvae attach themselves to the eye stalks, mouth parts, bases of the legs and dorsum of the carapace and probably share the food torn up by the crab. Thus the crab plays an important part in maintaining the life cycle of the fly. Earlier larviciding campaigns with DDT had failed because large numbers of streams in forested areas where the adult flies had been captured did not harbour the earlier stages and still more important, larvae were present in rivers that were outside the forests and had not been treated. Once the crab-larvae association had been established, crab hunts were organized in the affected areas and in this way all the breeding places were successfully mapped out.

### Simulium surveys

Before the larviciding campaigns could be commenced it was necessary to carry out

systematic surveys of the whole of Nyanza Province, an area of some 14 000 square miles (onchocerciasis is not found in other parts of Kenya). Careful planning enabled much time and money to be saved but nevertheless the operation took nearly three years to complete. Each of the teams employed on the surveys travelled some 3000 miles per year on foot in addition to approximately 15 000 miles by road. In some areas local labour had to be employed to cut paths through very dense bush and in the Kaimosi forest it was necessary to cut about 400 miles of paths, an operation which slowed down progress considerably.

Larvae and adult searches were usually conducted simultaneously but once the limits of the focus had been established the search for breeding grounds was intensified and became the main objective. Local youths, stationed about 50 yards apart in shady spots near the river's edge, were used as bait to attract adult flies. Catches were continued for a quarter of an hour and the team then moved on to the next point about 300-400 yards away. Various data relating to the catches were recorded by the team leaders and on return to camp in the evening the flies were identified and counted and the density calculated.

For the crab hunts designed to find the breeding places of the larvae two types of trap were used—the box trap for shallow water and the bait trap for deep water. The

box trap was open at one end while the other end and the four sides were covered with wire netting of a mesh fine enough to retain any crabs that entered. It was held down by means of a pole while other members of the team disturbed the bed of the stream. The trap was then lifted quickly and the crabs removed. The bait trap consisted simply of a circular tray of wire netting with a hook in the centre for bait. It was weighted to make it sink but was attached to a cork float. After about 20 minutes it was hauled out of the water with a quick swinging movement before the crabs had time to jump clear. Any larvae and pupae attached to the crabs were collected in tubes for subsequent identification and all relevant data recorded. Later a master map was prepared showing crab and *S. neavei* breeding places.

### Larviciding campaigns

Owing to the fact that *S. neavei* is found along densely wooded rivers and streams it is difficult if not impossible to attack the adults by spraying insecticide particularly in the more extensive forests. Reliance had therefore to be placed entirely on the use of larvicides. A larviciding campaign usually lasted three months and was generally carried out in nine cycles each of ten days duration.<sup>4</sup> Here again great attention was given to careful planning in order to ensure that every infested stream and river was treated once in every cycle. The discharge of each of the rivers at the time of year of the operations was first determined. The total discharge was then doubled to allow for dosing tributaries and from this figure the amount of insecticide needed was calculated. As a rule a concentration of 0.5 to 1 ppm (parts per million) was aimed at and 18% DDT in miscible oil was used. A margin of 25% was allowed to make certain that stocks of insecticide would be adequate as the missing of only one cycle would have led to failure. The ideal time for commencing the campaigns was found to be two to three weeks before the end of the rainy season as

the rivers then remained reasonably high throughout the subsequent period but the amount of DDT required was not as great as it would have been had the campaigns been commenced earlier. After each dosing had been completed checking units were sent to pre-selected catching points to make larval searches and if necessary the stream was re-dosed at a point above the site of infestation.

### Refugee crabs

Experiments were also made to observe the effects of larger doses of DDT on the crabs as it was thought that if the crabs could be killed by a single massive dose the campaign could be considerably shortened. The method proved to be unsatisfactory however as doses large enough to kill the crabs had a very deleterious effect on fish life. Moreover many of the crabs were seen to leave the stream and return later when the insecticide had passed downstream. Even at lower concentrations these "refugee" crabs can render the campaigns a failure by reinfesting treated rivers and it was found that the concentration of DDT must be below 4 ppm to ensure a tranquil crab population and no harm to the fish. In certain trout streams concentrations of only 0.1 ppm were used and fish barriers were built to prevent starving fish passing downstream to points from which they could not return.

### Results

By January 1953 *S. neavei* had been eliminated from all previously infested areas in South Nyanza. These included the large Kericho Kuya focus as well as two smaller ones Riana and Kodera which had been dealt with in 1942 and 1946 respectively.

In North Nyanza the larviciding campaigns were completed at the end of December 1954. Adult catches and searches for the earlier stages remained negative until December 1955 when the upper reaches of the Yala river were found to be infested. As all other rivers were still free a modified dosing scheme

<sup>4</sup> During one campaign seven cycles of four days were used, but this did not prove to be satisfactory.

was put into operation in February 1956 confined solely to the Yafa and its tributaries. Since then this area had also remained free from *S. neavei*. The failure of the earlier campaign in 1954 may have been due to the fact that a 14 day dosing cycle was used in the belief that the larval stage lasted at least 16 days. This assumption although supported by experimental evidence may have been incorrect and in the second campaign the

10 day cycle was used. One very small area of Kenya still remains infested along the south western flank of Mount Elgon. This is part of a much larger focus situated in Uganda and the Uganda medical authorities have undertaken the disinfection of the whole area. There is therefore good reason to hope that *S. neavei* will have been completely eradicated from Kenya in the very near future.

## OPPORTUNITIES FOR NURSES IN INTERNATIONAL HEALTH WORK \*

*No public health service can function effectively unless properly qualified nurses are available in sufficient numbers. For this reason WHO has always laid great emphasis on the recruitment and training of nurses. The need in many countries is still great and for a nurse with suitable qualifications a WHO assignment can offer rare opportunities of service under new and often exciting conditions. Some idea of these opportunities and the qualifications required is given in the article below.*

To be in at the beginning to help build something new is always an exciting and satisfying experience. If this something new is a service to alleviate human suffering the experience is all the more rewarding. Probably few nurses realize that through WHO there are opportunities for them to participate in building up such a service. In Egypt for example WHO is helping to strengthen the faculty at the Higher Institute of Nursing University of Alexandria which prepares nursing leaders for the Eastern Mediterranean Region. At present five WHO nurses are assigned to this programme and it is planned to increase the team to nine. One of the vacant posts is for the team leader a position corresponding to Dean of the nursing school. Egyptian nurses have taken an active part in the programme from the beginning and the ultimate aim is that the Institute should be staffed entirely by local qualified nurse instructors. By then a firm foundation will have been laid on

which to build up the work of this new educational centre for nurses and the mission of WHO will have been completed.

Another example comes from the Sudan where with the help of three WHO nurse educators the Government has started a new college of nursing at Khartoum. There is a vacancy for a nurse to undertake pre-clinical teaching and next year another instructor in medical and surgical nursing will be required.

But it is not only in the Mediterranean countries that such opportunities are to be found. In the Western Pacific and South East Asia Regions the nursing services are also undergoing rapid expansion. A new university school of nursing recently opened in Taiwan needs a nurse educator qualified in obstetric and paediatric nursing and another to teach general nursing. In Afghanistan a new school for male nurses has been opened in Kabul. With the help of the WHO nursing education team which includes two male nurse tutors an Afghan male nurse is being prepared for the position of Director of Nursing Service in the hospital

where the male students receive part of their clinical experience WHO is also helping in the training of female nurses midwives and auxiliary health personnel in Afghanistan. The Government of India is anxious that public health training should be integrated into basic nursing education. Public health nurses with experience in teaching and supervision are being assigned by WHO to schools of nursing in Madras Nagpur and one other town to be selected.

Assignments such as these present a far greater challenge than an ordinary nursing appointment and the rewards both personal and professional are correspondingly richer. For the same reason the qualifications demanded must go beyond a good education in nursing and several years' experience. First since the main purpose of WHO teams is nursing education the nurses sent on these assignments should have teaching qualifications and successful experience as teachers. For many of the posts qualifications in special branches of nursing such as midwifery paediatrics public health mental health or nursing service administration are required as well. It is useful too for the nurse undertaking an international assignment to know something of current trends in nursing experimental programmes and research, to be familiar with the functions of the nursing organizations and to understand nursing legislation. She should, if possible have a working knowledge of the language of the country to which she is

assigned or at least of a language that is generally understood there. But this is not all. To be suited for an international assignment a nurse must have the right type of personality: she must be adaptable and capable of working as a member of a team, and as time goes on she should be able to assume increasing responsibility. A knowledge of the ethnic groups in her own country and of her own culture will help her to understand the cultures and the problems of other countries. This will enable her to work with the people of the country rather than at them respecting their beliefs and traditions while at the same time imparting to them modern precepts of good nursing practice. All the time she is teaching she will be learning too—learning how to improve her didactic methods and her relations with others. This experience will stand her in good stead when she again returns to her own country.

There are already 155 WHO nurses serving in 44 countries but more are needed. In addition to nurse educators a number of senior nurse consultants are also required for public health work. Any nurse with the necessary qualifications who is interested in making a contribution to international health should apply to Personnel Section, World Health Organization, Palais des Nations, Geneva.

## Reports of Expert Groups

### FOUR YEARS OF POLIOMYELITIS RESEARCH

The second report of the WHO Expert Committee on Poliomyelitis has just appeared. During the four years which have elapsed since the publication of the first

report, research has made great strides in methods and new concepts have followed rapidly on one another and increased experience has been gained in various fields. Immunization using inactivated virus is being widely used in many countries and promising progress has been made towards the preparation of an attenuated live virus

WHO Expert Committee on Poliomyelitis (19 25) Second Report  
 Price 3 6, \$0.60 Sw f — Also published in French and  
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vaccine The discovery of enteric viruses resembling in some ways the viruses of poliomyelitis has proved to be of considerable importance These viruses the presence of which may complicate the diagnosis of poliomyelitis do not generally cause paralysis in man but are responsible for a number of conditions which in infants are sometimes fatal

The various aspects of the poliomyelitis problem which concern the public health administrator the epidemiologist and the laboratory worker are examined in the recent report of the Expert Committee and the findings are briefly summarized below Considerations and recommendations of particular interest to health authorities and relating more especially to the epidemiology of the disease are discussed in more detail on page 147 of this number of the Chronicle

In several parts of the world a considerable increase in the frequency of paralytic cases sometimes reaching epidemic proportions has been reported during the last three years particularly in areas where this form of the disease has not previously been a serious problem It is to be feared that this change is a prelude to more widespread and perhaps more serious epidemics In other countries on the contrary the position has improved frequently in association with mass immunization employing the inactivated virus vaccine

#### Results of national vaccination programmes

Since 1955 the inactivated vaccine has been used to an increasing extent in many parts of the world Large scale vaccination campaigns have been carried out in the United States Canada Australia the Union of South Africa Denmark Israel and Sweden The results of several of these campaigns and the conclusions that can be drawn from them are discussed in the report Thus in the United States where more than 70 000 000 doses of vaccine were administered in 1956 the reduction in paralytic cases is estimated to be 73 / In the United Kingdom the Medical Research Council assessing the results of a trial carried out in 1956 concluded that the incidence of paralytic poliomyelitis in vacci-

nated persons was only about one fifth of that in persons who were not vaccinated In the Union of South Africa there was a serious epidemic in 1956/1957 which unlike previous ones affected Africans with the same frequency as the European population the reduction in the incidence of paralysis among vaccinated children was of the same order as in the United States It was found that the administration of a single dose of vaccine is not sufficient to stop infection during an epidemic period nor does vaccination prevent the dissemination of the virus in the community In Australia where the frequency of the disease remained stationary from 1949 to 1955 there was an almost 90 / reduction in incidence during the 1956/1957 season and it was believed that much of this could be attributed to vaccination Elsewhere because of the small number of cases valid assessment of the results has not been possible Secondary reactions have everywhere been uncommon and of little importance

#### Inactivated vaccine

The mechanism by which formal inactivated the virus is not yet completely understood<sup>2</sup> The action of formaldehyde may either result in complete inactivation of the virus rendering it unable to multiply and to destroy tissue culture cells (loss of cytopathogenic effect) or bring about certain lesser changes which slow down its cytopathogenic action In the latter case when the residual activity of the vaccine is assayed by observing its cytopathogenic action in tissue cultures some still active virus particles may escape detection if the period of observation is relatively short There is therefore a danger that a vaccine may be regarded as free from active virus although still containing particles the activity of which having been greatly reduced by the formaldehyde can be detected only after long observation The discrepancies in the results of residual virus activity tests carried out in different laboratories may be partly explained by the fact that the

See in this Bulletin the article by S G d (1957) Bull  
W.H.A. 11: 17 1979

cultures were observed for different lengths of time

Furthermore inactivation is not a first order chemical reaction proceeding at a constant rate as was at first thought. Inactivation proceeds at a continuously decreasing rate and it does not seem that the reaction can be made a first-order one by homogenization of the virus suspension by filtration. Moreover this procedure has the drawback of appreciably decreasing the immunizing power of the vaccine. Swedish authors consider loss of formaldehyde to be responsible for the inconsistencies observed and the addition of formalol during inactivation has given promising results: this method is being further investigated. French workers have tried to solve this problem by using double inactivation with formaldehyde followed by beta propiolactone.

#### Attenuated live vaccine

Vaccine inactivated by formaldehyde protects most subjects against the paralytic form of poliomyelitis. But as used at present it is unable to interrupt the circulation of the virus within the community. It does not, in fact, give protection against the primary alimentary infection and consequently does not overcome the risk of the infection's being spread in the population owing to the presence of the virus in the stools.

Vaccination with attenuated live vaccine administered orally may provide the only means for eradication of poliomyelitis since it confers an immunity comparable to natural immunity including both humoral immunity and resistance of the intestinal tract to reinfection. This vaccine multiplies for several weeks in the intestinal tract of susceptible children and adults: the titre of antibody produced varying from one individual to another as in the case of natural infection. Strains derived from a single virus particle—isolated by the plaque method—are used for preparing this vaccine. Strains have been isolated belonging to all three types of poliovirus which are only very slightly neurotropic when injected in large doses into the spinal cord of monkeys and

which produce neither paralysis nor lesions when inoculated into the spinal cord of chimpanzees whose susceptibility is more nearly comparable with that of man. When the three types are administered separately—type 1, type 3 and then type 2—at intervals of three weeks they multiply in the intestinal tract and ensure a good production of the corresponding antibodies and resistance of the alimentary tract to reinfection.

Certain of the early studies carried out with the live virus administered orally<sup>2</sup> showed that the virus excreted in the stools might sometimes be more neurotropic than the one which had been injected. The extent of the change in neurotropism has been shown to vary considerably according to the strain used, and this is an important criterion in the selection of strains for the vaccine: those which show only a slight increase in activity being preferred. So far it is true that whichever strain is used viruses less attenuated than those administered can be demonstrated in the stools for short periods in a small proportion of persons, but these strains show no tendency to outgrow the more attenuated strains and they are still in the highly attenuated range of the neurotropic spectrum. It is noteworthy that the type 1, 2 and 3 viruses recovered in this way are less neurotropic for the monkey than those which have been isolated from the stools of healthy children during non-epidemic periods.

In these circumstances the Committee felt that the time has come to carry out trials of attenuated live vaccines under carefully controlled conditions and on an increasing scale eventually on tens or hundreds of thousands of volunteers so as to establish on a sufficiently large scale whether the expectations concerning the safety of such vaccines can be confirmed in practice.

#### Diseases resembling poliomyelitis

A disease can be said to resemble poliomyelitis only when paralysis of the lower motor neuron type is part of the syndrome. Among infectious diseases at present recognized only rabies and arthropod borne

encephalitis fulfil this requirement. The aseptic meningitis syndrome is often considered to be synonymous with non paralytic poliomyelitis. This is incorrect as several other infectious agents may be responsible such as certain Coxsackie A and B viruses and the viruses of mumps, herpes lymphocytic choriomeningitis and arthropod borne encephalitis as well as some of those of the ECHO group (enteric cytopathogenic human orphan viruses). Some of these viruses have been isolated from the cerebrospinal fluid of patients and clearly differentiated from poliomyelitis both in individual cases and during epidemics. The question arises however whether the Coxsackie and ECHO viruses cannot produce symptoms resembling those of poliomyelitis i.e. persistent weakness, paralysis or encephalitic manifestations in addition to the aseptic meningitis syndrome. The fact that some of these viruses are able to cause lesions in primate neurons during experimental infections is another reason for investigating this possibility.

#### Enteric viruses

The large variety of viruses isolated from the human intestinal tract during the last ten years has aroused great interest. Twenty four antigenic types of Coxsackie virus and 19 types of ECHO virus have been distinguished. Adenoviruses have also been found in the intestinal tract although they are predominantly inhabitants of the respiratory system. It has been established that certain ECHO viruses are responsible for syndromes such as summer diarrhoea in infants and children and for certain hospital epidemics among the new born. The Coxsackie and ECHO viruses resemble the poliomyelitis viruses as regards size, seasonal incidence and epidemiological pattern and it seems possible that these viruses may all belong to a single group of enteroviruses.

#### Recommendations for further research

There are many points awaiting further investigation in the various fields briefly

described above. The Committee mentioned the following in particular:

- 1 Improvement of methods for assessing the antigenic potency of inactivated virus vaccines making use of guinea pigs, chicks and other animals considered as non susceptible to poliomyelitis as well as of various media *in vitro*.

- 2 Improvement in the stability of inactivated virus vaccines in view of the problems of transport, especially in the tropics.

- 3 Study of neurological, allergic and other complications following the injection of inactivated virus and comparison with similar complications produced by other forms of vaccination.

- 4 Effectiveness of combined immunization agents e.g. against diphtheria, tetanus, pertussis and poliomyelitis and the optimum schedule.

- 5 Comparison of the three techniques in use for virus neutralization tests.

- 6 Use of the precipitin technique for the rapid diagnosis of poliomyelitis.

- 7 Application of the complement fixation test to the diagnosis of poliomyelitis and other enteric virus infections.

- 8 Means for the laboratory recognition of strains with a strongly paralytogenic behaviour in man. In this connexion the characteristics of strains isolated during particularly severe epidemics should be examined.

- 9 Increase in knowledge concerning the safety and efficacy of attenuated live virus vaccines under a variety of field conditions.

- 10 Importance of enteric viruses as causes of human disease particularly in infants.

- 11 Investigation of a number of basic problems in the epidemiology of poliomyelitis using the newer and more accurate techniques.

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The report includes five annexes dealing with the carrying out of laboratory tests and with serological surveys.

## MARITIME VENEREAL-DISEASE CONTROL

Public health authorities from five maritime countries together with members of the secretariats of the International Labour Office and the World Health Organization, met in December 1956 to consider the provisions of the Brussels Agreement of 1924 from the point of view of the health administrator of today. In their report<sup>1</sup> much of the early history of maritime venereal-disease control is described for the first time—the original text of the Brussels Agreement and details of its implementation are given in full—and a bibliography on the health of seafarers is appended.

It has been said that "the seaman does not as a rule contract venereal disease at sea but on land and in a port which is not his home". This comment at once brings out the particularly international character of the threat presented by these diseases which until comparatively recently constituted a considerable risk for a large group of workers in many countries with far reaching consequences for both the public health and the economy. Thirty five years ago the incidence of venereal diseases was very high: certain governments and international bodies had already contributed much towards providing special treatment facilities for infected seamen but the decisive step towards international control was taken simultaneously by the International Labour Organization and the Office International d'Hygiène Publique (OIHP) in drafting legislation aimed at making treatment freely available to seafarers on the widest possible scale. In 1921 the Belgian Government took the initiative of proposing the adherence of seafaring nations to a draft Agreement drawn up by the OIHP which was subsequently signed at Brussels by 13 countries. In 1924 the Belgian Ministry of Foreign Affairs became the depository for this

international instrument receiving ratifications and accessions as further countries decided to associate themselves with the convention to which 29 sovereign states and 38 territories now adhere.

From time to time the Agreement has been reviewed by the OIHP, the Health Organization of the League of Nations and WHO and recommendations have been made on its implementation—as for example the listing of treatment facilities throughout the world in the *International Directory of Venereal Disease Treatment Centres at Ports*; the application of the Agreement to the great international river systems; the revision of the Personal Card carried by seamen and proposals regarding serodiagnosis and therapy. Since the Second World War a general improvement in social conditions and the simplification of treatment resulting from the development of antibiotics have very greatly mitigated the seriousness of maritime venereal disease. Thus it seemed again desirable to reconsider the provisions of legislation which had been drawn up under such different circumstances. As early as 1948 one of the first preoccupations of WHO was how the Agreement might be brought up to date technically and whether it should ultimately be replaced by international health regulations for venereal disease control. As a basis for these deliberations WHO arranged a number of studies (some in co-operation with the International Union against the Venereal Diseases and Treponematoses) to gather information on the nature, extent and control of venereal infections in ports at one of which—Rotterdam—a demonstration project was set up with the collaboration of the Netherlands Government. In 1956 the Netherlands National Committee for the Revision of the Brussels Agreement reported that it considered the convention to be "an excellent example of the value of international co-operation in the field of health" this finding was endorsed by the WHO Study Group which met at the

<sup>1</sup> WHO Study Group on the Agreement of Brussels, 1924, respecting Facilities to be given to Seafaring Nations for the Treatment of Venereal Diseases (19 56) Report *Wld Hlth Org* vol. 1, No. 150, 63 pages. Price 3 s. 6 d. 50 Sfr 5 f. 2.—Also published in French as *Santé m.*



end of that year to make a detailed examination of the Articles of the Agreement. While recognizing certain shortcomings previously indicated both by the Netherlands Government committee and by the First World Health Assembly in 1948 the Group concluded that it would be inadvisable to attempt to replace the Agreement by another type of international instrument but that the technical aspects of its provisions should be periodically reviewed by a WHO expert committee and that recommendations on minimum standards of practice under these

provisions might be made available to interested governments. It further proposed that the possibility should be explored of establishing a broader international approach to the health problems of seafarers comprehending prevention treatment and rehabilitation in all fields of health. This would call for much preliminary study of present conditions and facilities and a careful evaluation of the requirements of such an international maritime health service which might eventually be expected to absorb the provisions of the Brussels Agreement.

### Medical education

"The second edition of the *World Directory of Medical Schools* is a great improvement on the first. Any gaps in the information given in the former edition have now been filled and some anomalies put right. Moreover the scope of the present edition has been considerably enlarged for instead of simple tabulation of details about medical schools there is now an excellent description of the general educational system and the main features of undergraduate medical education in each country. In addition useful items such as the population of the country, the ratio of medical graduates to population and the number of medical graduates per annum have been added. These data are summarized by continent and world totals are also provided. This is now a unique and most valuable work of reference.

*Canadian Medical Association Journal* 1958 78 386

World Health Organization (1957) *World Directory of Medical Schools*. London: P. H. R. Ltd. £1 5 53 00

### Operations to be financed from the Malaria Eradication Special Account

At the end of December 1957 malaria eradication was practically achieved in 9 countries or territories and very far advanced—and even fully achieved for large areas—in 7 other countries or territories. It was being implemented in 44 countries and planned in 16 more. In 63 countries or territories however eradication was not yet being planned.

The Eighth World Health Assembly authorized the Director General of WHO to obtain financial contributions for malaria eradication from governmental and private sources and established a Malaria Eradication Special Account to be credited with voluntary contributions received in any usable currency and with the value of contributions in kind. Following the receipt in December 1957 of a voluntary contribution of \$5 000 000 from the United States of America which brought the total amount of contributions up to \$5 115 000—sufficient to meet the estimated costs of operations through 1958—it became possible to proceed with the planning of many projects which had been the subject of preliminary negotiations with the governments concerned. The programme of operations planned to be financed from the Malaria Eradication Special Account over the next five years has now been published.<sup>1</sup>

In presenting this programme the Director General of WHO points out that the ultimate aim of the policy of malaria eradication is the eradication of the disease from the world. The greatest possible amount of assistance must be given to countries which without it, would be unable to implement or perhaps to plan a programme. Obviously countries which have eradicated or are eradicating malaria from their national territories have an interest in their neighbours doing the same. Assistance is also needed for some countries

to accelerate the eradication work on which they have embarked.

It is known that today it is premature to plan eradication from certain areas where economically feasible procedures for the interruption of transmission have not yet been developed. This applies to large areas of tropical Africa and New Guinea, and to limited areas in certain countries where malaria is transmitted by vectors not amenable to present methods of control by residual insecticides. Nevertheless for those areas it is important to undertake local investigations with a view to finding an early solution of the problem of how to interrupt transmission.

In many countries where eradication is technically feasible a period of preparation will be required. This involves the drawing up of a plan and in some cases a pre-eradication survey by national or international personnel for a period of about one year before a plan can be developed. But even the best plan of operations appropriately financed cannot be implemented if adequately trained personnel are not available. It is therefore a necessity in some countries or territories to provide such training before the actual operations start.

The programme for the next five years has been developed in the light of the foregoing conclusions. The operations which it is planned to finance from the Special Account supplement and do not supplant the assistance which countries receive or are expected to receive under the regular budget of the Organization or the Expanded Programme of Technical Assistance. Account has also been taken of the contributions that UNICEF is making and it is hoped will continue to make towards malaria eradication.

Activities envisaged in the programme to be financed from the Special Account include training programmes to meet the great dearth of trained professional staff, laboratory and field research programmes, a field investigation of surveillance methods

and a study of special techniques for the spraying of tents and temporary shelters and for the periodic administration of drugs to nomad populations in those areas where nomadism is interfering with the development of eradication projects. The direct assistance to national eradication programmes which makes up the greater part of the costs of the planned operations includes not only international services in the form of personnel fellowships supplies and equipment but also local services. The latter may include when essential the provision of funds to governments for the payment or partial payment of salaries of malaria eradication personnel at the levels established by the country concerned and the provision of national fellowships. In order that the Organization may give the most effective and expeditious assistance to governments provision has been made for the necessary increase in staff at Headquarters and in the regions.

### Public health planning in Africa

A community's beliefs and practices concerning illness and death are deeply rooted in its cultural history as well as in its present day way of life. The outstanding problem facing the public health worker in Africa is that of teaching a scientific outlook on the causes and prevention of illness to people who have no ordered scientific knowledge about human physiology the spread of disease or the effects of treatment. This problem is stressed by Margaret Read in a study entitled *Social and Cultural Backgrounds for Planning Public Health Programmes in Africa* recently published by the WHO Regional Office for Africa.<sup>1</sup>

The focus of any public health programme in the rural areas of Africa is inevitably the village. In the case of a campaign against yaws which has quick and spectacular results the co-operation of the villagers may be relatively easy to obtain but difficulties

arise when progress is necessarily slow as for example in campaigns against such diseases as malaria tuberculosis and hook worm. Although the planner and public health worker may be tempted to start operations in those villages where the need is greatest this is not always the best policy. In general the most suitable centres for rural health campaigns are villages where signs of progress and the wish to co-operate are already evident.

In rural Africa as in other tropical and under developed areas the community development approach which encourages villagers to help themselves has proved extremely successful in connexion with public health and similar campaigns. For example in the Agwu Division Eastern Nigeria with a population of 150 000 every village has taken part in some sort of community development project. Thus over a period of three years 41 village water points—rain water tanks springs or wells—were completed 5 leper villages were established 5 maternity homes were opened and 6 villages reconstructed their markets in durable materials. Community development has wrought a tremendous change in the life of the ordinary villager and change always breeds fresh problems. The people of Agwu can however face any new tasks which may come their way with an increased unity and confidence in their ability to carry them out.

### Rehabilitation of handicapped children

A joint WHO/UNICEF programme of assistance to the Lebanese Government in establishing a rehabilitation centre for handicapped children was recently brought to a successful conclusion. The centre which was opened in 1955 at the Cité des Apprentis Libanais Hazmieh under the direction of Dr J Craft WHO consultant for the programme contains physiotherapy and hydrotherapy rooms and a prosthetic workshop for all of which the equipment was supplied by UNICEF.

Physiotherapy and hydrotherapy were started in October 1955 under the supervision

<sup>1</sup> This 40-page study serves as a background document to WHO seminar on health education in Africa held in Dakar from 18-22 Feb. 1957. Copies may be obtained from the WHO Regional Office for Africa, Brazzaville, French Equatorial Africa.

of a WHO physiotherapist Miss C. G. Johnson and within a few months over 40 children were attending the centre for treatment each day while 200 more were on a waiting list. In the course of the programme regular demonstrations of physiotherapy techniques and the art of muscle testing in lower neuron disease were held for final year students from the American University and the French Faculty of Medicine Beirut. At the end of 1956 a formal eighteen month training course in physiotherapy sponsored by the French Faculty of Medicine was started at the centre. Training in the manufacture of orthopaedic devices was given to local personnel by Mr M. Tournepeche the WHO prosthetic technician.

Wide interest was aroused by the programme and at the beginning of 1957 a second rehabilitation centre—attached to the American University—was established in Beirut with the collaboration of the WHO physiotherapist. When the WHO/UNICEF programme concluded in June 1957 both centres were operating to capacity and the demand for their services had grown to such an extent that the Lebanese Ministry of Health was planning to open further centres at the St George and Khoury Saade Hospitals Beirut.

#### Nursing training in the Seychelles and Tunis

WHO undertook in 1954 to assist the Government of the Seychelles in the training of public health nurses and the organization of a public health nursing service. This task was achieved last year when a team of six trained nurses took over responsibility for all public health nursing in the islands.

This team was trained by a WHO public health nurse—Miss Birgitte Hauglund—and is directed by a senior public health nurse who spent four months in the Federation of Malaya under a WHO fellowship to gain further experience in supervision, administration, organization and teaching. Two courses were given each lasting for nine months and combining theory and practical work. As a preliminary a sample survey was conducted in 468 houses to assess the needs for

domestic nursing and to enable the WHO public health nurse to become familiar with the way of living, customs and beliefs of the people. The curriculum of the courses was based on the health needs of the community, the characteristics of the population, the personal and professional status of the students and generally accepted public health nursing activities.

The programme of the Seychelles public health nursing service comprises maternal health (ante and post natal care), infant and pre school health, school health, tuberculosis control, venereal-disease control, control of other communicable diseases, home nursing and health education. Public health nursing districts have been established, and a field practice manual has been compiled by the members of the team. A substantial part of the equipment for the public health nursing service has been supplied by WHO including nursing kits, film strips, reference books, scales for schools and child health clinics, vision charts, etc.

Impelled by the need to recruit and train auxiliary personnel for the implementation of national public health programmes, the Government of Tunisia called on WHO to render some assistance in the training of nurses and nursing aides. Accordingly two nurse educators were sent to Tunisia in September 1955.

Activities were centred in the Government nursing school in Tunis which was to act as a kind of model for the other two Government schools in Sousse and Sfax. A comprehensive three year course embracing the principles and practice of nursing was established. Bedside teaching was introduced, and under the guidance of the two educators, local nursing tutors instructed first and second year students in the techniques of their future profession. Practical teaching at all times stressed the preventive and social aspects of nursing.

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Recruitment was considered an important feature of the project. The two educators were in personal contact with the principals of secondary and technical schools among

which a revised nursing recruitment prospectus was widely circulated. In addition the Ministry of Health set up a stand devoted to nursing activities in the Tunis Trade Fair. As a result the proportion of Tunisian candidates for the nursing course rose considerably.

In December 1955 the Ministry of Health decided to modify the preparatory year of nursing training established three months before into a course for nursing aides. The WHO nurse educators helped to organize this course the curriculum of which included an introduction to theoretical anatomy physiology hygiene general pathology pharmacy and child care accompanied by practical work. Assistance was also given to the organization of a midwifery course which included teaching principles and advice on preventive aspects.

### Composting of organic wastes

Rapid progress has been made during the past few years in the processing of human excreta and other organic wastes so that they may be used as fertilizers without presenting a danger to public health. The World Health Organization which published a monograph on this subject in 1956<sup>1</sup> is at present helping the Japanese Government to develop a

prototype composting plant at Kobe City for the treatment of both human excreta and urban refuse.

The plant is designed to hasten the process whereby complex organic substances are broken down by aerobic decomposition into simpler and more stable compounds for use as plant nutrients. Decomposition is accelerated by grinding the organic material so as to expose greater areas to aeration and by using forced aeration to supply the oxygen necessary for fermentation.

A pilot plant which was constructed early in 1955 and remained in operation until July 1956 provided valuable information which was taken into account in the construction of the full size plant. The latter is designed to take 25 tons of refuse and 10 tons of night soil per day. The plant has undergone continual revision based on operating experiences and further revisions are planned before its design is accepted as final. So far only refuse has been processed but when the design and operational procedures have been further improved it is planned to process night soil as well. Final costs cannot yet be determined but it is expected that they will be no higher than those of other slower and more complicated methods of disposing of organic wastes. In fact in speed and economy the procedures developed in Kobe City are believed to represent a considerable advance on the composting techniques hitherto employed.

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## People and Places

### Yaws campaign in Sierra Leone

Dr P H Maury went to Sierra Leone at the end of March to take up the post of WHO Medical Officer attached to the WHO/UNICEF assisted yaws campaign which has now successfully covered one of the country's three provinces.

Dr Maury who studied medicine at the University of Paris holds diplomas in bacteriology and hygiene and has carried out post graduate research in dermatology and venereology. For the past three years he has been in charge of the WHO assisted campaign against syphilis in Morocco.

### Health education

Mr Urban Nelson has been assigned by WHO to advise the Government of Burma on health education activities including the training of personnel and the development of health education in schools.

Mr Nelson has served as City Health Educator for the Metropolitan Vancouver Health Committee British Columbia Canada and as Public Health Educator with the British Columbia Department of Health.

### Training of sanitary inspectors

In connection with a WHO assisted environmental sanitation project now in progress in the Philippines

the Government has prepared a long range sanitary programme which will require the recruitment and training of several hundred sanitary inspectors over the next five years. A general plan of training has been prepared by Professor Earnest Boyce, WHO consultant and will be put into effect by Mr Gerard C Murphy of Ireland who is going to Manila in June as WHO Sanitarian.

Mr Murphy holds certificates in sanitary science from University College and the Institute of Science and Technology, Dublin, and a diploma from the Royal Institute of Hygiene and Public Health, London. He has been active in organizing the training of health inspectors in Ireland, and has been a member of the Irish Health Inspectors' Training Committee since 1953.

#### Malaria control for North Borneo

WHO, UNICEF and the United Nations Technical Assistance Board are helping the Government of North Borneo to train malarialogical workers and to carry out a malaria control programme.

Dr Melencio Santos Marañ, a malarialogist attached to the Division of Malaya of the Philippine Department of Health, has been appointed WHO Medical Officer for this project. A graduate of the Faculty of Medicine, University of Santo Tomás, Manila, Dr Santos Marañ has received special training from the United States Public Health Service and has also studied modern malaria eradication techniques in Guatemala, El Salvador, Mexico, Venezuela and Jamaica, under WHO auspices.

#### Malaria survey in Ghana

Dr Ignace Vincke of Belgium has gone to Ghana on behalf of WHO to carry out an entomological and malarialogical survey as preliminary to possible malaria control.

Dr Vincke has had almost thirty years' experience of malaria work in the Belgian Congo and has made important contributions to malaria research. In 1956 he was WHO consultant on the UNICEF/WHO government missions which toured all the malaria projects in the French territories of Africa and made recommendations for their future conduct.

#### Development of epidemiological services

For the past two years an epidemiological unit attached to the Central Fever Hospital in Colombo, Ceylon, has been engaged in the study of disease prevalence in the country. This unit includes the other branches of the Ceylon Medical Service on matters relating to epidemiology and trains and graduates and postgraduate students in epidemiological methods.

Dr Josip Falisevac, Assistant Professor of the Medical Faculty and Head of Department of the Fever Hospital, University of Zagreb, Yugoslavia, has gone to Ceylon, on behalf of WHO, to assist the Government in this work and in the development of the country's epidemiological services in general. Dr Falisevac was educated at the University of Zagreb and has also spent some time at the Park Fever Hospital and the Central Public Health Laboratory, London, and at the London School of Hygiene and Tropical Medicine.

#### Sanitary engineering courses

Professor Landon J. Murphy of the United States will join the staff of the Faculty of Engineering, University of Alexandria, Egypt, as WHO Visiting Professor of Sanitary Engineering on 1 June 1958. His duties will include the continuation of specialized courses leading to a university degree which were started by Professor Harvey White in 1956 and the development of post-graduate courses in advanced sanitary engineering. In addition to his university work, he will organize and give refresher courses for graduate engineers already in government service.

A graduate of Iowa State College, Professor Murphy holds advanced degrees in sanitary engineering, and is in charge of undergraduate and post-graduate sanitary engineering studies at the University of Missouri. He has also acted as consultant on sanitary engineering programmes in Germany and the Philippines.

#### Regional appointments

Dr Henry Richards has been appointed Public Health Administrator in the WHO Regional Office for South-East Asia. His duties will include the planning, co-ordination and supervision of public health projects in the countries of the Region. A specialist in public health and tropical medicine, Dr Richards is a former Deputy Director and Director of Health Services in the Sudan. More recently he has been engaged in the development of public health services in Ghana.

Dr S. Iwa Khuri-Otaqui has been appointed Maternal and Child Health Adviser in the WHO Regional Office for the Eastern Mediterranean. A graduate of the American University, Beirut, Dr Khuri-Otaqui was awarded a WHO fellowship for advanced training in England and Scotland in 1955. She has been serving for some years as Senior Medical Officer in charge of maternal and child health services with the United Nations Relief and Works Agency for Palestine Refugees and was responsible for the planning of the WHO seminar on maternal and child health held in Cairo in November-December 1957.



# Review of WHO Publications

*An International Nomenclature of Yaws Lesions* by C J Hackett Geneva 1957  
(World Health Organization Monograph Series No 36) 103 pages Price £1 \$4 00 or Sw fr 12 Also available in French and Spanish

As explained in the introduction to this recent monograph the lack of a generally recognized nomenclature of yaws lesions during the past half century has produced much confusion. This has of late become more apparent as widespread yaws control activities have gathered momentum on an international scale. The readiness of countries to pool public health experience and material resources together with the evolution of techniques for mass treatment campaigns was greatly stimulated by the appearance of a new and effective remedy for yaws in long acting penicillin. It was quickly realized however that these practical developments had outstripped what may be regarded as a fundamental tool in the knowledge of any disease—an agreed terminology.

Innumerable synonyms—of purely local origin (yaws trash) incorporating some outmoded diagnostic theory (mother yaw daughter yaw) simply descriptive (ghoul hand *piandis lichénoides* crab yaws) or sometimes merely a vague term indiscriminately applied (yaws ulcer)—led to inaccurate reporting of the disease. Moreover the difficulty of determining the order of appearance of lesions in the course of the disease was further complicated because latency and relapsing lesions made certain manifestations liable to be incorrectly attributed to particular stages of the disease.

These and other problems of diagnosis aggravated by the confused nomenclature were encountered when in 1949-50 national yaws control campaigns with WHO and UNICEF collaboration were started in Haiti Indonesia the Philippines and Thailand. In 1951 three members of the trepone-

matoses control project in Indonesia prepared as a provisional guide for field workers a liberally illustrated monograph<sup>1</sup> which attempted to relate some synonyms for the various skin manifestations of the disease to a simple clinical description. Over the past five years however much additional knowledge has been accumulated so that the nomenclature now published may be regarded as superseding the earlier one in the *Atlas of Framboesia*.

In 1952 at the First International Symposium on Yaws Control in Bangkok a classification of yaws lesions into nine groups was outlined. This was subsequently approved with minor modifications by the WHO Expert Committee on Venereal Infections and Treponematoses meeting in London later the same year<sup>2</sup>. More recently a simple classification of yaws patients has been established for general use in mass campaigns<sup>3</sup>. The relationship of the nomenclature of yaws lesions now published to the earlier classification into nine groups and to the classification of yaws patients for mass campaigns is illustrated in an annex to the monograph.

The development of the nomenclature presented in this monograph has been the responsibility of several bodies with the co-ordination of the Venereal Diseases and Treponematoses Section WHO. In its fourth report which appeared in 1953 the WHO Expert Committee on Venereal Infections and Treponematoses recommended

that WHO take steps to establish through a corresponding study group suitable standard nomenclature applicable for clinical and scientific purposes in the study of yaws<sup>4</sup>.

<sup>1</sup> H K R., Kodj R. & S. dadi M. (1951) *Atlas of yaws lesions*, G. (H. H. alish O. gani) Monograph Series No 5.

<sup>2</sup> WHO Weekly Report 1953 63 33.

<sup>3</sup> H K R. & C. J. G. (1956) *WHO Weekly Report* 1956 369.

<sup>4</sup> WHO Weekly Report 1953 63 34.

Such a group of experts came into being in 1955 when 18 persons with practical experience of yaws from 16 different countries responded to a questionnaire prepared by the Venereal Diseases and Treponematoses Section of WHO and accompanied by 181 photographs of characteristic lesions. The replies together with the available literature on yaws terminology were studied in WHO and a report was prepared. This was considered by a small working party elected by the participants in the International Conference on Yaws Control which was held at Enugu, Nigeria, in November 1955. A revised version of this report was then recirculated to the original group of experts to the working party to all participants in the Conference and to all members of the WHO Expert Panel on Venereal Infections and Treponematoses for further review. The replies received from this last inquiry have been taken into consideration as far as possible in the preparation of the recently published monograph.

Thus the text of this monograph has been drawn from the opinions of many past and present authorities on yaws from many countries. The illustrations of the lesions have been carefully selected from African material; they should contribute to a clearer recognition of the manifestations of the disease. It is hoped that this publication will be of practical value both for training in yaws campaigns and for general teaching in tropical medicine and communicable diseases.

*Bulletin of the World Health Organization*  
1958 Volume 18 Number 3 (pages 275-480)

This issue of the Bulletin opens with two articles forming part of a series of studies on the laboratory diagnosis of various diseases which it is hoped will eventually be revised and published in monograph form. The first of these articles by W. Burrows and R. Pollitzer concerns the laboratory diagnosis of cholera while in the second John E. Blair deals with the laboratory diagnosis of staphylococcal infections. An effort has been made to ensure that the

diagnostic methods recommended in these studies are as internationally representative as possible by submitting them to a number of experts from different countries.

The growth of the insecticide resistance problem throughout the world between July 1956 and November 1957 and the developments in research on the subject during the same period are reviewed by A. W. A. Brown. A problem which could become an equally serious threat to the control of disease—that of untoward reactions to penicillin administration—is discussed by O. Idsøe and Ping Nan Wang in a study on penicillin reactions in Taiwan which can be considered as a “potentially penicillin sensitized country”. That evidence for an increase in the incidence of such reactions is at present inconclusive however is shown in a note by R. R. Wilcox who analyses replies to a WHO questionnaire on the subject.

The first part of a report on an important WHO assisted pilot project for the control of bilharziasis japonica in the island of Leyte, Philippines is contributed by T. P. Pesigan and co-workers. In addition to a detailed review of the epidemiological situation on the island in respect of bilharziasis and other common helminth infections this paper includes an account of the techniques adopted by the control team, a section on the natural history and public health significance of bilharziasis and an assessment of the relative roles of human and other hosts in the transmission of the disease.

Finally notes are included on the following subjects: yaws in Brazil (Ulysses Motta de Aquino); the effect of numbers and age on the susceptibility of mosquitos to DDT (G. Raffaele A. Coluzzi & J. de Zulueta); virus content of brains and submaxillary glands of animals suspected of having died of rabies (N. Veeraraghavan, A. Balasubramanian & R. Rangaswami); psychomotor development in African children (M. Geber & R. F. A. Dean); and water supplies and latrines in Egyptian villages (Harold Shipman et al.). The list of contents appears in the advertising section at the end of this issue of the Chronicle.

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L ORGANISATION MONDIALE THE WORLD HEALTH  
DE LA SANTÉ ORGANIZATION

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Laboratory diagnosis of staphylococcal infections — *John E Blair*

The insecticide resistance problem a review of developments in  
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PRINTED IN SWITZERLAND

## ENDEMIC GOITRE A PUBLIC HEALTH ANACHRONISM

The iodization of domestic salt as a means of preventing endemic goitre was first recommended by the French scientist J B Boussingault as far back as 1831 His advice went almost unheeded however and it was not until ninety years later that a large scale experiment conducted by Marine and Kimball demonstrated the complete efficacy of this measure Nearly forty years have passed since then and endemic goitre is still prevalent in almost every country of the world Yet it is recognized today that if iodized salt were introduced everywhere for domestic use simple goitre would become a disease of the past Goitre is in fact an anachronism.

The failure of many countries to take sufficiently active measures against endemic goitre springs from a number of causes lack of conviction that iodization of salt would be effective doubts about the safety of the method technical difficulties and in some cases perhaps underestimation of the importance of the problem It is true that endemic goitre is not a killer disease but even in its milder forms it is responsible for much human misery and has serious repercussions on the physical social and economic well being of the population In the hope of stimulating interest in prophylactic measures and of assisting governments in investigating the position in their countries WHO organized a Study Group on Endemic Goitre in 1952 subsequently publishing its report and a number of individual papers on the subject in its Bulletin (Vol 9 No 2) A more comprehensive account of what is at present known about the prevalence etiology and control of endemic goitre is given in a second collection of papers published in a recent number of the Bulletin (Vol 18 No 12) and reviewed below It is hoped that these papers will later be revised and re issued together with some supplementary material in the form of a monograph

### Goitre and drinking water

In the opening paper F C Kelly and W W Snedden present a comprehensive country by-country survey of the prevalence and geographical distribution of endemic goitre The survey covers nearly 120 countries of the Americas Europe Africa Asia and Oceania in all of which endemic goitre has been recorded—an impressive testimony to the global nature of the problem But although goitre is so widely distributed the prevalence varies from less than 1/ in some areas to close on 100/ in others Districts of high and low prevalence may be only a few miles apart they may even be neighbouring villages Usually the determining factor can be demonstrated to be the quality of the drinking water which in turn is largely determined by the type of terrain over which the water flows The iodine content of the soil is derived from atmospheric iodine liberated from sea water by oxidation and carried inland by winds The iodine is brought down by rain or snow but the process of building up an iodine rich soil takes hundreds of thousands of years The glaciers of the last Ice Age swept away the older iodine rich soils and the postglacial soils generated by the grinding up of virgin rocks contained at the most one tenth the average iodine content of mature agricultural soils The prevalence of goitre in North America and in a number of countries of Europe Asia and Australasia is closely correlated with the extent of quaternary glaciation and the length of time since the glaciers receded

It is not only the iodine content of the water that is important however Several studies have shown that hard water appears to have an adverse effect on iodine utilization at least, in areas where the drinking water is hard a considerably higher intake of iodine is needed to prevent goitre than is the case where the water is soft Here again

of course it is the composition of the terrain over which the water flows that determines its hardness

Another quality of the drinking water that appears to bear a relation to the prevalence of goitre is the degree of pollution. This was already suggested fifty years ago by McCarrison who noted that in eight Himalayan villages situated one above the other on the mountain side and served by the same water supply the goitre rate increased gradually from 11.8% in the highest village to 45.6% in the lowest. McCarrison showed that suspended matter filtered from the grossly polluted water of the latter village produced goitre in volunteers. Boiling the suspended matter destroyed its goitrogenic action. Moreover a neighbouring village which had an independent water supply of exceptional purity was free from goitre. It has recently been suggested that the goitrogenic substance is a urochrome derivative which binds copper in the serum.<sup>1</sup>

### Goitre and diet

Kelly and Snedden describe a number of instances in which a high goitre rate has been ascribed to the consumption of goitrogenic foodstuffs especially cabbage, kale and other vegetables of the *Brassica* genus. In Tasmania a scheme was introduced in 1949 for issuing potassium iodide tablets to all schoolchildren. Five years later a survey showed that there had actually been a marked increase in the goitre rates of the children except in girls over 12 years of age. When the country was partitioned into six districts it was found that in three of them there had been a fall in prevalence as expected whereas in the other three there had been a steep rise suggesting that here some other factor was operating. It was recalled that one year after the first issue of potassium iodide tablets the Government introduced a free milk scheme for school children. As a result of the increased demand for milk the farmers had extended their plantings of choux moellier (marrowstem

kale) a crop used for grazing cattle during the winter months. The districts where choux moellier cultivation increased most were found to correspond exactly with those where there had been a steep rise in goitre prevalence and milk from choux moellier fed cows could be shown to interfere with the uptake of iodine both in laboratory animals and in humans. It has not yet been possible to isolate the goitrogenic substance from the milk but it is known that vegetables of the *Brassica* genus do contain anti thyroid substances of the thiourea group.

Similar explanations have been advanced of experiences in Denmark and in Belgium during the Second World War. In Copenhagen the incidence of thyrotoxicosis increased slowly from 1938 to 1941 rose sharply in 1942 and reached a peak in 1943-44. It then fell again so that by 1947 the rate was practically the same as in 1939-40. In Denmark soya bean which is known to contain an anti thyroid factor is normally used as cattle feed. It has been postulated that sufficient of this anti thyroid factor finds its way into the milk to keep down the incidence of thyrotoxicosis. Supplies of soya bean were cut off entirely from 1941 to 1945 so that the rise in thyrotoxicosis at this time might well have been due to the lack of the anti thyroid factor in the milk.

The wartime experience of Belgium was the reverse of that of Denmark not only was there no increase in the number of cases of thyrotoxicosis but the severity of the existing cases decreased. At the same time there was an increase in the incidence of simple goitre. These two phenomena may have been due to the increased consumption of cabbage and other *Brassica* vegetables during the war in Belgium.

A striking example of how dietary habits and the general way of life may influence the incidence of goitre is provided by the two villages of Lampoe and Tjatoer in Bali which are situated only a few hundred yards apart. At Lampoe there is not a single case of goitre among the 100 inhabitants. They are Chinese traders who have intermarried with the native Balinese. Their food is varied and they boil their drinking water

By contrast goitre is very prevalent in Tjatoer. Its 700 inhabitants of pure Balinese stock lead a poverty stricken existence subsisting on a monotonous diet of maize and rice and drinking unboiled water from a goitrogenic spring.

Another interesting case is that of French West Africa where the 14th parallel forms an almost rigid barrier between the goitrous and the non goitrous zones. The salt used by the peoples of the latter zone is natural sodium chloride from sea water or from the rich salt producing areas of the south Sahara. But the salt trade routes have never penetrated much below the 14th parallel and people living south of this line are dependent on "pot ash" obtained by the incineration of local plants. This vegetable salt is probably deficient in iodine or may even contain an as yet unidentified goitrogenic agent.

### Iodine and the thyroid

Although a number of factors have been incriminated in the production of endemic goitre the majority of studies carried out with modern methods have provided evidence of iodine deficiency in the diet. Some of these studies and the relationship between the thyroid and iodine metabolism, are discussed in a paper by J. B. Stanbury.

In areas where endemic goitre does not occur the mean daily intake of iodine is usually above 75-200  $\mu\text{g}$  mainly in the form of inorganic iodine. Part of the iodine of the blood is trapped by the thyroid for the manufacture of thyroid hormones. Normally the concentration of iodide in the thyroid is twenty times that in the plasma but it may be much greater if there is thyroid hyperplasia. The iodine not trapped by the thyroid is excreted by the kidneys and the daily urinary excretion of iodine serves as a useful index of the quantity of iodine ingested. Surveys have shown that the mean iodine excretion of persons living in endemic goitre regions is much lower than that of persons in other areas. The low ingestion of iodine is also reflected in an increased avidity of the thyroid gland for iodine as measured by administering radio-active iodine. Studies

in western Argentina, the Netherlands and Finland have shown that patients excreting low amounts of iodine in the urine take up abnormally large quantities of radio active iodine.

When iodide supplements are given to patients with endemic goitre a slow readjustment of iodine retention takes place until a new state of balance is reached. It seems that at a level of about 5 mg a day the capacity of the gland to absorb iodide from the blood is reached and if more iodide is given most of it is rapidly excreted.

Trapping of iodide by the thyroid is inhibited by administration of thiocyanate or perchlorate and it is believed that the goitrogenic substances contained in certain foodstuffs act in a similar way. On the other hand, the uptake of iodide by the thyroid is increased by the action of the thyroid stimulating hormone (TSH) secreted by the anterior lobe of the pituitary gland. The rate of secretion of this hormone depends in turn on the concentration of thyroid hormones in the blood. A fall in circulating thyroid hormones causes an increased output of TSH by the pituitary thus stimulating the thyroid to produce larger quantities of thyroxine and triiodothyronine. This feedback mechanism for maintaining the correct concentration of thyroid hormones in the blood is in fact also the mechanism by which goitre is produced. The process of thyroid enlargement and its sequelae are discussed by F. W. Clements.

### Goitres and their sequelae

Although in highly goitrous areas thyroid enlargement may occur in pre-school children or may even be present at birth, it is more usual for the available iodine to be sufficient to meet the demands of early childhood. In most areas the ages at which the highest incidence of goitre occurs are 9-13 in boys and 12-18 in girls—years when the child is undergoing very rapid development and perhaps taking vigorous exercise as well. It is rare for goitre to make its first appearance in adult males but in women the metabolic stresses of pregnancy and lactation



tation may trigger off the development of goitre or cause successive step wise enlargement of an existing one

As indicated above enlargement of the thyroid is brought about by the action of the thyroid stimulating hormone released by the anterior pituitary gland in response to a low concentration of thyroid hormones in the blood. In the initial hyperplastic phase of enlargement the thyroid may return to normal if the iodine deficiency is remedied or the goitrogen removed. As soon as the gland is large enough to trap sufficient iodide its structure starts to change by deposition of colloid in the acini. The colloid goitre is the normal resting stage and the condition found in most children with endemic goitre. If additional iodine is given at this stage the goitre will usually become smaller and firmer but will seldom disappear entirely. If iodide prophylaxis is given to children with goitre however the thyroid gland increases little in size compared with the over all rate of growth so that there may be no visible evidence of goitre by the time adulthood is reached. Provided that prophylaxis is continued throughout adult life it is unlikely that there will be any unfavourable sequelae.

If no additional iodide is given the thyroid goes on enlarging progressively until the age of about 15 to 18 years. In males it may then gradually diminish in size again but in women especially those who bear children goitres usually go through repeated phases of hyperplasia corresponding with fluctuations in the demand for hormone. During the resting phases involution leads to the formation of nodules which are often multiple and scattered irregularly throughout the gland tissue. Large nodular goitres sometimes contain haemorrhagic cysts.

Up till the third or fourth decade of life colloid or nodular goitres seldom have much adverse effect on health but later typical signs and symptoms of myxoedema may slowly develop. A connexion with thyrotoxicosis is less well established. In some parts of the world notably North America the British Isles and parts of continental Europe and Australia it has been possible to

bution of thyrotoxicosis

with a high incidence of endemic goitre but there are other highly goitrous areas where toxic goitre appears to be rare or absent. It is possible that these differences reflect differences in the etiology of endemic goitre.

It has also been suggested that endemic goitre predisposes to carcinoma of the thyroid and there are some data to support this hypothesis. Other workers have failed to find any correlation however and it is doubtful whether a definite answer can be given at present. Finally there is some evidence that endemic goitre can increase the risk of malignant disease in general.

### Goitre and cretinism

Clements reviews the present state of knowledge on the subject of cretinism and its possible association with endemic goitre. Attention has often been drawn to the prevalence of cretinism in areas of endemic goitre and many writers favour a causal relationship. But about one third of all cretins do not have goitre and cretinism occurs in persons who have never lived in a goitrous district. Clements distinguishes five types of cretinism: congenital thyroid aplasia, familial congenital goitrous cretinism, acquired athyroidism, acquired hypothyroidism, endemic cretinism.

In *congenital thyroid aplasia* the child is born without any functioning thyroid tissue and cannot therefore have a goitre. Cretinism is very severe. Growth is stunted—adults are seldom more than 3 feet high—and mental development does not take place. Such cretins are deaf mutes and are incapable of caring for themselves. The condition can be cured by giving thyroid hormone provided that treatment is started at a sufficiently early age.

*Goitrous cretinism* may be a familial disease. In one study four of the subjects were members of one family and three were cousins of these. The enlarged thyroid of such cretins shows a marked avidity for iodine but is unable to manufacture any thyroid hormones. Cretinism is usually somewhat less severe than in cases of thyroid aplasia.

*Acquired athyroidism and acquired hypothyroidism may be secondary to certain infectious diseases such as measles or whooping cough and cases have been reported in children whose mothers had taken anti thyroid drugs during pregnancy. It seems that the condition can also be caused by the use of cobalt therapy for blood dyscrasia. The degree of cretinism in these cases depends upon the age of onset of the condition and the amount of functioning thyroid tissue remaining.*

The etiology of *endemic cretinism* is still a matter of controversy. It is widely held that endemic cretinism is a consequence of endemic goitre resulting from progressive deterioration and enlargement of the thyroid gland through several generations but Clements cites a number of objections to this theory. Some regions such as the Jura and the Andes have had long histories of endemic goitre yet cretinism is rare. Moreover many cretins are the children of parents who did

not have thyroid enlargement. It has also been noted that cretinism is often concentrated in villages or even in households and investigators in Hungary found that the deeper they penetrated into the mountains the more frequent cretinism became. Finally the prevalence of cretinism seems to bear a direct relationship to the extent of intermarriage. Taken in conjunction with the high familial factor which has been found in studies on sporadic goitrous cretinism this suggests that endemic cretinism may be an inherited disease transmitted through a recessive Mendelian factor.

### Goitre surveys

From a public health point of view it is important to have a fairly accurate knowledge of the prevalence of goitre in a population. The classification of goitre and the technique of goitre surveys are discussed in an article by C. Perez, N. S. Scrimshaw and

FIG. 1 TECHNIQUE USED IN EXAMINATION OF THYROIDS



St go si nd gf g th pat e r th exam  
plac his th mb g l on ether x de f th  
th old ar a d d i mt th x e f th gland  
b palpat

**J A Munoz** Mass surveys are most conveniently carried out on schoolchildren and since children do not often have large visible goitres it is necessary to use a palpation technique as well as simple inspection. The usual method of palpation recommended for clinical appraisal is from behind but for mass surveys where large numbers of people need to be examined rapidly it is more convenient for the examiner to stand or sit in front of the subject so that inspection and palpation can be carried out almost simultaneously (Fig 1). For practical purposes a gland estimated to be 4 to 5 times the normal size should be listed as goitrous. Various standards of comparison have been suggested perhaps the most useful being that the lateral lobes of the thyroid should not be larger than the terminal phalanges of the subject's thumbs.

The authors suggest that the goitres should be classified in the following way (Fig 2)

#### *Group 0 persons without goitre*

#### *Group 1 persons with palpable goitres*

The thyroid in these persons is estimated to be more than 4 to 5 times the normal size but is not visible with the head in the normal position.

*Group 2 persons with visible goitres* The goitres are easily visible on inspection with the head in the normal position but are not noticeable at a distance.

*Group 3 persons with very large goitres* The goitres are recognizable at a considerable distance and are grossly disfiguring.

The surveys can be speeded up by the use of small printed or mimeographed forms on which to enter the necessary data relating to the locality and the person examined. With the aid of the teacher the children can usually prepare their own forms in advance. As each child steps forward to be examined he hands his form to the recorder and the examiner calls out the number indicating the size of the gland and whether nodules or adenomas are present (this is indicated by encircling an A printed on the form). In this way 150

to 200 children per hour can be examined.

For practical purposes a high degree of accuracy is not necessary in estimating the goitre prevalence. A figure which does not depart from the true value by more than 25% is adequate but it is important when planning a survey to ensure that the areas included constitute a random sample of the total geographical area. In a densely populated and homogeneous area it may be sufficient to examine 1/10 of the population but in thinly populated districts with a low prevalence it is necessary to examine a considerably larger proportion. The sample should be representative of all the numerically important sections of the population in the age group studied both from a geographical and from an occupational point of view. Tabulation of the data obtained in the surveys must proceed in several stages and the authors suggest three different types of form for this purpose. The first is for the tabulation of data relating to a single locality, the second for combining data by age groups from several localities and the third for tabulating data from all age groups in an area or country. Although by taking into account the percentage of the population studied it is possible to calculate from these figures the goitre rate for the whole population it is recommended that iodization programmes should be based on the prevalence of goitre in children since the purpose of such programmes is to cater for the current need of iodine.

#### *Goitre therapy and prophylaxis*

The first attempts to use iodine for the treatment of goitre were made soon after the discovery of iodine in seaweed in 1811. Unfortunately the doses employed were so high that iodism and Jod Basedow (iodine induced hyperthyroidism) were frequent side effects and iodine therapy fell into disrepute. In 1895 Baumann showed that iodine is a normal constituent of the thyroid gland a discovery which ushered in a revival of interest in the use of iodine for the treatment and prophylaxis of goitre. J Matovinovic and V Ramalingaswami in their contribution to the Bulletin trace these developments

FIG 2 CLASSIFICATION OF GOITRES

Top ght G p 1 got easily palpable but  
not visible with head in normal position

Bottom left G p 2 got easily visible with  
head in normal position

Bottom right G p 3 getting enlarged  
and becoming increasingly distant



and outline the principles upon which modern treatment and prophylaxis are based

**Treatment** The therapeutic dose of iodine is not known with certainty but the authors are of the opinion that it need not be more than double the daily requirement. Estimates of the optimum iodine requirements vary widely however from 50  $\mu$ g to 300  $\mu$ g daily. Taking the various published recommendations into consideration the authors come to the conclusion that the therapeutic dose need not exceed 200 to 300  $\mu$ g per day. This is provided by taking 4 to 6 drops daily of a solution containing 0.03 g of potassium iodide in 20.0 ml of water. Tablets or sweets containing potassium iodide or iodate are also useful particularly for the treatment of schoolchildren and expectant and nursing mothers. With the dosage recommended above side effects are exceedingly rare.

The therapeutic effect can usually be observed after four to six weeks but treatment should be continued until general prophylactic measures have been instituted. If no response has occurred after three months it is probable that the goitre is not due to simple iodine deficiency and thyroid preparations should be substituted. This applies particularly in cases of sporadic goitre due for example to an innate defect in iodine metabolism or to excessive intake of a goitrogenic substance. Thyroid is also indicated for adults with advanced nodular degenerated or cystic goitres which often fail to respond to iodine. The dose has to be adjusted to the requirements of the individual patient. It is suggested that treatment should be commenced with 50 mg per day and the amount gradually increased up to a maximum of 300 mg per day. Patients must be kept under observation during treatment if symptoms of thyrotoxicosis should appear treatment must be interrupted for 14 days and then resumed with a 25.50 mg smaller dose. In any case treatment should be stopped after six months and regular iodine prophylaxis instituted. Some patients relapse despite iodine therapy and the authors recommend that such patients should be given a short course of thyroid therapy for

the first 7-14 days of each month. If hypothyroidism is present it is necessary to continue giving thyroid as substitution therapy. It may happen that the inhibition of secretion of thyroid stimulating hormone persists after withdrawal of thyroid treatment (Farquharson's phenomenon) or alternatively that a rebound hypersecretion occurs leading to hyperthyroidism but such complications are very rare and of temporary duration.

The authors also discuss the indications for thyroidectomy. This operation now carries a mortality of less than 0.2% and a better knowledge of the anatomy and physiology of the thyroid and parathyroid glands has enabled most of the post operative complications formerly encountered to be overcome. Certain other forms of treatment to which the authors refer briefly—such as X ray and radium irradiation—have not given satisfactory results and are not recommended.

**Prophylaxis** The decision to introduce mass prophylaxis is easy to take in areas of high endemicity where many of the adult population have large nodular goitres or where there is a significant increase in the incidence of hypo- or hyperthyroidism. In areas where the endemic is mild and goitre is mainly confined to adolescents however there is often doubt as to whether the effort and expense of a mass control programme are justified. The authors point out that the so called physiological goitre of adolescents is not a physiological phenomenon—it disappears as soon as iodine prophylaxis is introduced—and that goitrous children tend to be less intelligent than those with normal thyroids. They make the tentative suggestion that general prophylaxis should be undertaken if 10% or more of children between the ages of 7 and 15 have visible enlargement of the thyroid.

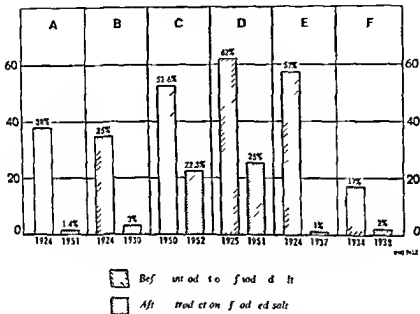
As has already been indicated the fundamental principle of the mass prophylaxis of endemic goitre is the administration of supplementary iodine. Even where goitrogenic factors are present their effect can usually be counteracted by increasing the iodine intake providing that the limits of

safety are observed. Nevertheless it may sometimes be possible to reduce the incidence of goitre by other measures such as changing the supply of drinking water where this is excessively hard.

Of the various methods that have been tried from time to time for providing supplementary iodine the iodization of salt has been found the most practicable. It is the

least expensive method of providing a continuous supply of iodine and is both safe and reliable whatever the dietary habits of the population. Fig 3 shows some of the remarkable decreases in goitre incidence that have been achieved following the introduction of iodized salt. Methods of iodization of salt are discussed by J C M Holman in the final paper of the series.

FIG 3 REDUCTION OF GOITRE INCIDENCE RESULTS OBTAINED BY THE USE OF IODIZED SALT



A St. Louis, Mo., USA

B City of Detroit, Mich., USA

C North Carolina

D Chesham District, New Zealand

E City of Lausanne, Switzerland

F Krakow, Poland

#### Iodized salt

The greater part of Holman's article is concerned with details of technical processes but there are a few points of more general interest. One of these is the choice of iodine compound. Formerly sodium or potassium iodide was used exclusively but iodides have the disadvantage that they are unstable in the presence of moisture and that owing to

their solubility they are attracted to areas of high moisture content and thus often migrate from the salt to the material of the container. Potassium iodate on the other hand is a very stable compound and has a low solubility. It has been shown to be rapidly assimilated to be effective in the treatment of goitre and to be well tolerated. It is therefore recommended that potassium iodate should be used whenever the salt is likely to

contain moisture or impurities or to be exposed to adverse climatic conditions. If potassium iodide is used the salt should be free from impurities, should be reasonably dry and free running, should be packed in containers with impervious linings and should be stored in a cool dark place. A stabilizing agent may also be added. High grade salt conforming to these requirements is available only in countries with high living standards and is quite unknown to most inhabitants of the world.

The levels of iodization adopted in different countries vary from 1 part in 10 000 to 1 part in 200 000. In fixing the level, public health authorities must consider the average amount of salt consumed per head per day, the prevailing dietary habits, the possible existence of goitrogenic factors and whether all food salt is to be iodized or only table salt. It is suggested that the level chosen should be such as to ensure a minimum daily intake of 150  $\mu$ g of iodine and that where goitrogenic factors are present or the dietary standard is low the supplement should be increased up to 300-400  $\mu$ g.

Both the manufacturer and the distributor need reliable and accurate methods for determining the iodine content of iodized salt. Two methods developed by modifying the technique devised by von Fellenberg are described by Holman. Both of these have

been accepted by the Association of Official Agricultural Chemists in the USA after satisfying rigorous tests of reproducibility, and it is recommended that they should be adopted in all countries to facilitate direct comparison of results. A very sensitive method has been developed by Rogina and Dubravac for determining the small amounts of iodine that may be present in normal supplies of salt in saline deposits and in sea water. This method may be of value when making preliminary surveys of the sources of dietary iodine available to a population.

\* \* \*

The two themes running through all the papers reviewed above are the world-wide importance of endemic goitre as a public health problem and the ease with which the problem could be banished by the universal introduction of mass prophylaxis. Because salt is a convenient vehicle for administering iodine supplements and because the quantities of iodine required are so minute, the solution is a relatively inexpensive one. In fact, as Marine expressed it, "The old adage that one ounce of prevention is worth a pound of cure is outdone in the case of goitre where one milligram of prevention is worth more than a thousand milligrams of cure."

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### *Index to International Digest of Health Legislation*

In view of the scope and variety of the material published in the *International Digest of Health Legislation* and in order to facilitate reference and research, it has been decided to issue cumulative indexes to this publication from time to time. The first of these indexes—which consolidates and amplifies the indexes to the first five volumes of the Digest covering the period 1948-1954—has just been published. The price of the index, which is available in English and French, is 3/6 \$0.70 or Sw fr 2.

## THE FUTURE OF THE MENTAL HOSPITAL

*The mental hospitals of the past were often prison-like buildings where patients were forcibly detained and often with little hope for the future. The emphasis has now shifted to rapid cure and rehabilitation, with the majority of patients being treated outside the hospital. The psychiatric hospital of the future may be pictured as a therapeutic community where the treatment and rehabilitation of the individual is the main aim. In this only a small specialist unit for severe mental illness and investigation is an absolute necessity. The Medical Officer of the Ministry of Health (England and Wales) and WHO Committee suggest how these concepts might be applied when designing and building up modern mental health services under various conditions. His principles and conclusions are summarized below.*

A revolution is at present taking place in the treatment of mental disease and the design of mental hospitals. Only fifteen years ago more than half the patients in the average mental hospital in England and Wales were detained there against their will cut off from the outside world except for occasional visits from relatives and friends. They could expect to remain there for at least six months and the majority were destined to spend the rest of their lives in this seclusion. In fact they were treated more like prisoners than patients and the hospitals were often built on the same lines as prisons. In many parts of the world even today no distinction is made between mental disease and criminality.

All this is changing however. Hospital bars are being removed doors opened and patients encouraged to come voluntarily for treatment as they would to any other hospital. Hand in hand with recent advances in treatment hospital staffs are adopting a much more positive attitude to mental disease. Patients who would have been regarded as incurable a few years ago are being discharged and the average stay of patients recovering within one year is now only about two months. Special short stay units are being constructed for these patients away from the main hospital and the number of admissions is being kept to a minimum by

treating as many patients as possible in out patient clinics often attached to general hospitals. Other patients are receiving domiciliary treatment and old people are being cared for in the geriatric departments of general hospitals. Overcrowding is thus disappearing.

### Planning a mental health service

These are the broad lines along which the mental health services in England and Wales are at present evolving. But to attempt to impose this pattern rigidly on other countries with different traditions and cultures and at different stages of development might well lead to disappointment and failure.

The first essential of a plan for a mental health service is that it should be realistic. Three groups have to be convinced not only that the scheme is workable but also that it will benefit them personally: the medical and nursing staff of the existing psychiatric service, the government administrators and the public. The initial appeal must be to the doctors because without their support the scheme can never get started. As the doctors and their staff generally claim to be overworked they must be convinced that their work will be made easier by adoption of the plan. Administrators are more likely to approve a plan that is either already in



operation or can be started without involving them in any great financial outlay or political responsibility. Finally the plan should be self advertising and flexible and should be so framed that once the first step has been taken a public demand is created for the next

### The starting point

If the first step is going to ease the work of doctors and nurses it must be directed against overcrowding of the hospital. Gross overcrowding is after all probably the most serious obstacle to mental hospital reform because it makes individual attention impossible and regimentation inevitable. Experience in England and Wales has shown that enlarging and modernizing a hospital does not of itself, relieve overcrowding. But it has been found that very many of the patients formerly admitted to hospital can be treated successfully in out patient clinics. Furthermore doctors welcome the chance that out patient work provides to get away from the hospital for a time and administrators can be safely assured that out patient clinics are easy to set up and cheap to run. Out patient treatment is thus a convenient starting point for the reform of a mental health service. It is naturally much more acceptable to the patient and his relatives than admission to hospital so that the provision of one clinic soon leads to a demand for others. Indeed it is no exaggeration to say that the prestige of a modern mental hospital depends largely on the results of its out patient care.

It is suggested that the out patient department should be equipped to give electric convulsive therapy from the start properly given this is a safe form of treatment which can be extremely useful in reducing the number of admissions to hospital. An important function of the clinic is to obtain a history of the patient and his family and a picture of his present social environment. Although this is best done by the psychiatric social worker it is possible for sufficient information to be elicited by a nurse or other untrained worker using a simple questionnaire. At the same time the doctor in the

clinic should make contact with other social organizations by a personal approach he can obtain much background information that will enable him to help his patients. In return he will find himself swamped with requests for advice—but this is a healthy way for a preventive service to start. The out patient clinic is also useful for establishing closer links with general medicine particularly as it is most conveniently placed in a general hospital.

### Modernizing the hospital

The ideal site for a mental hospital is near the centre of the community it is to serve. Not all hospitals are so sited and most of them are of old fashioned design. But the building of a new mental hospital is a rare event so that in general the best must be made of existing buildings. The prison like atmosphere can be toned down considerably by the removal of bars and the use of paint and whitewash. Once overcrowding has been relieved by opening up out patient clinics and if possible by using the geriatric and domiciliary services in general hospitals there are other reforms that can be introduced. First a section of the hospital should be set aside and converted into a modern treatment unit for short stay patients. If a separate building is not available a ward or part of a ward in the main block could be used but it should have a separate entrance so that its occupants have no contact with the rest of the hospital population. It is important that the unit should be adequately staffed from the start even at the expense of the rest of the hospital. Reliable patients can often assist in nursing to relieve staff shortages.

The short stay unit will be the shop window of the new mental health service and a high standard of comfort and efficiency should be aimed at. The decoration and equipment should make a complete break with those of the traditional mental hospital. Beds should be provided even in countries where patients are accustomed to sleeping on mats on the floor because they made modern treatment and nursing safer and

easier. For a unit attached to a hospital of originally 1000 beds twenty beds for each sex should be sufficient if possible with room for expansion to forty without overcrowding. The success of the unit will depend largely on the efficient screening of patients before admission and except in emergencies no patient should be admitted to it without having been thoroughly examined in an out patient clinic. At the same time care must be taken that it does not degenerate into an admission unit to which all patients are first sent before admission to the main hospital though in exceptional cases patients who cannot be discharged in a reasonable time—say six months—will have to be transferred to the main wards.

In recent years much has been made of the open door policy but the unlocking of doors is not so much an end in itself as the inevitable result of the lessening of overcrowding and a better atmosphere in the hospital. Although there has been opposition from the nursing staff in some places it usually happens that once one ward is opened the staff soon request the opening of others because they find it makes their work easier. It is a mistake however to open doors until the incentive to go out has been provided. In the traditional mental hospital with its emphasis on the custody and segregation of the patient it was necessary to provide a miniature township with elaborate facilities for occupation and recreation within the hospital itself. In a properly sited hospital this is no longer necessary or desirable. The usual varieties of indoor handicrafts should be available but as soon as the patient is well enough he must be encouraged to go outside and find the same type of amusement as the general public. In this way the patients do not have a chance to become dependent on organized recreation and the fact that they are forced to keep in touch with the public during the early stages of convalescence is all to the good.

For the long stay patient of course some form of occupation must be provided. To be of real therapeutic value this should be work in which the patient can take an interest and

which will give him a sense of achievement. The dangers of allowing patients to re-decorate and modernize their own wards have been much exaggerated and are outweighed by the benefits both to patients and staff. In some hospitals the patients have even erected new buildings made of concrete blocks and in times of full employment neighbouring industrial firms often welcome the additional labour that a mental hospital can provide.

The self respect and self reliance of the patient can be further encouraged in a number of ways. Important among these is the practice of allowing every patient to have his own marked clothing. The beneficial results of this measure well repay the additional work involved. Patients should also be provided with a certain amount of pocket money which they can spend as they choose. Opportunities for contact with the opposite sex give patients a new interest in their appearance and an incentive to improve their manners. Meals should be taken in a common dining room and mixed hostels for old people are becoming increasingly popular. The use of women doctors for men's wards and *vice versa* is already a common practice.

### Collaboration with other services

If a mental health service is to run efficiently it is not sufficient merely to provide adequate facilities for the care and treatment of patients in the hospital and in out patient clinics. There must also be a close liaison between the staff of the mental hospital and the mental health section of the local authority. In particular the social workers of the two services should work together if possible in collaboration with other voluntary and State sponsored services interested in mental health and the welfare of discharged patients. In one town in England what is virtually a domiciliary service has evolved in which the social workers carry out the treatment prescribed by the psychiatrists. In this way admissions to hospital have been greatly reduced in proportion to the number of persons seen and treated. A system of this kind also enables the hospital psychiatrists to play

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a part in the social field outside with benefit both to the community and to the doctors themselves

Some of the most successful psychiatric treatment is given by the family doctor and the development of psychiatry in general practice is now being studied in England and Wales by organizations representing the general practitioners and psychiatrists. Close association with the general hospitals is also important. It is now generally accepted that every out patient department of a general hospital should include a psychiatric section staffed by doctors from the local mental hospital and an increasing number of general hospitals are making beds available for psychiatric patients who need in patient care but not necessarily in a mental hospital

### Alternatives

In some areas the prerequisites for setting up a mental health service along the above lines do not exist. There may be no mental hospital at all or the hospital may be so bad that the only proper course is to close it. In such circumstances the first thing to do is to establish a headquarters from which a mobile team can operate. Preferably this should be a building attached to a general hospital. A store room, a classroom for training staff and a record office are all that are needed at first so that a very simple structure will do. Later it can be expanded to include a diagnostic centre where special investigations can be made.

In some countries it is customary to care for the mentally sick in their own homes. It is advisable to preserve such a tradition where it is already established with the mobile teams responsible for prescribing and supervising treatment. In other cases a treatment centre can be set up consisting of a number of very simple buildings in which the patients and their families can live. The adjacent headquarters then serves as a base for the treatment of out patients as well as of residents. Non medical staff should be recruited locally and since their duties will be almost entirely custodial they can be untrained even illiterate. In fact illiteracy

is sometimes an asset as unsophisticated patients may mistrust a literate person. One of the main advantages of this system is that it enables patients to be treated in their home environment and the relatives not only see what is going on but also help with the nursing. In many countries outside Europe—for example in Africa—patients from rural areas pose a major problem in large urban hospitals as they speak different languages have different cultures and customs and sometimes even eat different food.

For the incurable socially unacceptable patient who cannot be admitted to these treatment centres other arrangements must be made. But the hope of recovery should never be abandoned nor should the patient be allowed to sink into a state of social dilapidation. Long term care should be so organized that those who must accept it are still able to feel that they are of use. Employment of some sort should therefore be provided and opportunities for contact with friends and relatives should also be readily available. The central custodial type of hospital is obviously undesirable but there are other possibilities of which the working village is a good example. In any case the units should be kept small. They can be managed by a layman but the psychiatrists in charge of the mobile team should pay regular visits and act as advisers.

### Criminal lunatics

There is one type of patient who does not fit into any of the schemes outlined above—the mentally disordered criminal. The suggestion is sometimes made that criminal lunatics should be treated in the company of and under the same conditions as other mental patients. This however throws an unjustifiable strain on the nursing staff and is likely to result in a reversion to the policy of custodial care for all. Such patients are relatively few in number and there is much to be said for bringing them together under one roof. Public opinion demands that criminal lunatics should be kept in strict custody and it is undesirable that this type of care should become associated with that of mental patients in general.

# TEACHING OF PAEDIATRICS IN LATIN AMERICA

## Results of a Survey

The twofold nature of the physicians' task—preventive and curative—as paediatric medicine is marked in paediatrics that in any other branch of medicine. Health authorities and professors of medicine in Latin America have long been aware that the improvement of training in paediatrics is a prerequisite for any generalization of the maternal and child health services. In 1956, as a first step in this direction, the Pan American Sanitary Bureau (WHO Regional Office for the Americas) undertook a survey of the teaching of paediatrics in Latin America and the Caribbean. The methods used in this survey, together with its findings, are summarized below.

### Survey preliminaries and methods

The aim of the survey was to obtain a clear picture of the paediatric education provided in Latin America to see where improvement was needed to help the medical schools evaluate their curricula and to bring paediatric education closer to the community.

When the survey was begun in 1956, professors of paediatrics throughout Latin America were asked for details on the size of their classes, the time devoted to the subject, the range of instruction, the number of beds available in hospitals for practical work, the size and composition of the teaching staff and the extent of co-ordination with general public health services for children. Data were obtained from 79 medical schools in 69 of which paediatrics was taught, the total number of paediatric chairs being 74.<sup>2</sup> Visits were paid to a number of schools in order to verify and add to the data already obtained from the professors.

During these visits, library services, lecture halls, laboratories and teaching material and installations were inspected and chiefs of departments were interviewed to obtain exact information on the precise type and scope of teaching programmes.

In addition, visits were paid to paediatric hospitals, paediatric wards in general hospitals, maternity wards, private clinics, child health centres and similar establishments in which students do practical work. Details were obtained on the types and numbers of cases studied, the equipment, the real extent of participation by students, the methods and procedures employed, the number of professors in relation to students and the quality of the registers and clinical charts.

### Analysis of the situation

On the basis of the data received, an analysis was made of five particular aspects of the teaching of paediatrics: (1) distribution of schools and students; (2) time devoted to the subject; (3) available teaching facilities; (4) paediatric faculties; (5) other teaching activities.

#### Distribution of schools and students

These factors, like the others, varied considerably from country to country. In Brazil there were 23 schools of medicine; in Mexico 17; in two countries 7; in four countries 3; and in 11 countries one. In Jamaica there was a school serving all the British colonies of the Caribbean area and in Surinam a Dutch language school. The only Latin American country without any school of medicine was Costa Rica. Ten schools of medicine were without any chair

Summary of paper by M. E. Wegman, J. O. Hughes & R. R. Puffer published in *Spa* in 801 of *Ann. Paediatr.* 44: 811. It also appears in *En. Lab.* personal supplement, *Pediatr.* in 1957, 1: 5.

The definition of the term "chair" (cattedra) varies from one country to another; in some it represents a single professor, in others it denotes a department.

of the disease was low *E. coli* was found in 131/ of the infants but in only 16% of the 3 year old children the findings for *Proteus* were similar. On the other hand the frequency of *Shigella* was relatively low for infants (62%) increasing to 213% for 3 year olds while *Salmonella* was found in only 2737% of the children examined. Similar investigations are now being made in Pernambuco Brazil in areas where incidence is high by the Brazilian Special Service of Public Health and studies on the subject have been carried out in the Hospital Infantil Mexico <sup>4</sup>.

Studies on the prevalence of *Shigella* and *Salmonella* have been made in selected areas of California and Texas (USA) Egypt and Guatemala where death rates from diarrhoeal disease were high. In every instance *Shigella* was found more frequently than *Salmonella* its prevalence being lowest among infants under 1 year and highest among children 1 year old. The lower prevalence and incidence of *Shigella* infection in infants raise interesting questions concerning the fundamental mechanism of transmission of the disease.

Data on mortality trends in the United States over a period of 20 years during which the quality of water supplies was improved show that this improvement definitely contributed to a decline in mortality from typhoid fever but that its influence on the death rate from diarrhoeal disease was less marked. However an abundant supply of water in or near the home by encouraging a higher level of personal cleanliness undoubtedly helps to interrupt the transmission of hand carried *Shigella* infection as was shown in recent investigations in the United States.

The control of flies is an essential part of any programme to reduce the spread of *Shigella* infection. Not only should the use of insecticides for this purpose continue but further studies on insecticide resistance should be encouraged together with a systematic

investigation of the reasons for the increase in fly breeding.

Animals are known to play an important role in the transmission of *Salmonella* infection. This has special implications particularly in certain rural areas of Latin America where animals and humans often live in close association. No great effort would be needed to keep animals out of dwelling houses thereby substantially reducing the risk of contamination.

For a long time information on protein malnutrition was scanty and physicians were not in a position to diagnose it and certify it as a cause of death. However recent data on the seasonal distribution of protein deficiency morbidity and mortality in Guatemala and El Salvador (in particular the infantile multi deficiency syndrome known as kwashiorkor) seem to suggest that there may be a relationship between protein deficiency and diarrhoeal disease. This is a complex subject which requires further study.

In all countries with low standards of living and hygiene special attention should be paid to the feeding of infants. There is no doubt that in such countries breast feeding offers much greater protection against diarrhoeal disease than artificial feeding. A survey made by Woodbury<sup>5</sup> in the United States at a time when that country's infant mortality rate was high showed that deaths from all causes and from gastrointestinal diseases were far more frequent among artificially fed than among breast fed infants. The chances of infection increase in most areas from the age of 5-6 months. Even in primitive rural conditions however mothers can be taught to make the child's diet safer by early protein supplementation thus helping to lower the incidence of diarrhoeal disease. In the countries referred to the reduction of deaths from this cause will ultimately have to be achieved by the prevention of malnutrition and of contamination through feeding and by the application of specific measures for early oral rehydration.

<sup>5</sup> Woodbury R. M. (1953) *Cause of infant mortality in the United States*. Labor Publication N 14. Washington D.C.

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<sup>1</sup> Summary of report by M. E. Wegman, J. G. H. Lee & R. R. Puffer published in Spanish in Bol. O.N.S. 44, 1957. The report is in English as special supplement to Pediatr. in July 1958.

The definition of the term chair (director) given from one country, other in some, represents others as an employment.



**TABLE 1 NUMBER OF SCHOOLS OF MEDICINE AND PAEDIATRIC STUDENTS PER 100 000 INHABITANTS IN LATIN AMERICAN COUNTRIES AND TERRITORIES 1958**

Country or territory	Schools of medicine	Paediatric instruction		Number of paediatric students	Population	Paediatric students per 100 000 inhabitants
		yes	no			
Argentina	7	6	1	1 563	19 470 000	8.0
Bolivia	3	3		66	3 235 000	0
Brazil	23	17	6	1 448	9 846 000	2.4
Colombia	7	6	1	475	12 939 000	3.3
Cuba	1	1		250	6 000 000	4.2
Chile	3	3		191	6 941 000	2.6
Dominican Republic	1	1		109	2 463 000	4.4
Ecuador	3	3		129	3 777 000	3.4
El Salvador	1	1		25	2 69 000	1.1
Guatemala	1	1		45	3 3 9 000	1.3
Haiti	1	1		35	3 345 000	1.0
Honduras	1	1		20	1 711 000	1.2
Mexico	17	15	2	1 249	30 538 000	4.1
Nicaragua	1	1		39	1 287 000	3.0
Panama	1	1		12	934 000	1.3
Paraguay	1	1		80	1 601 000	5.0
Peru	1	1		107	9 651 000	5.3
Uruguay	1	1		140	2 651 000	5.3
Venezuela	3	3		185	5 949 000	3.1
Jamaica	1	1		23	3 362 000	0.6
Surinam	1	1		32	220 000	14.5
Total	79	69	10	6 573	181 747 000	3.6

<sup>a</sup> Estimated population

<sup>a</sup> Population of British colonies in the Caribbean

in paediatrics (see Table 1). Paediatric students in the remaining 69 schools (in 19 Latin American countries plus Jamaica and Surinam) numbered 6573. Among the 182 million people covered by the survey the proportion of paediatric students worked out at 3.6 per 100 000. The paediatric student/population ratio ranged from 8.0 per 100 000 to 0.6 per 100 000. In five countries and in the British colonies in the Caribbean the proportion was about 1 per 100 000 inhabitants whereas in Argentina—

which had the highest ratio of all—it was 8 per 100 000. (The ratio for Surinam (see Table 1) has not been taken into account since it is atypical and unlikely to be maintained in succeeding years.)

The number of students studying the subject in the various schools ranged from a maximum of 720 to a minimum of 6, the first quartile being 22, the median 46 and the third quartile 109. Seven schools (10% of the total) accounted for 47% of students covered by the study. Some idea of the uneven

distribution of paediatric students may be gathered from the fact that something over 87% of all such students were entered with 34 schools whereas only 12% were attending the remaining 35 schools none of which had more than 50 of these students

The serious shortage of physicians in Latin America has led an increasing number of students to choose what is in general a career offering a certain security. Moreover the authorities insist that the schools should make room for as many students as possible—which often means far more than their facilities warrant. In fact in many schools less than 50% of the students admitted graduate and although the numbers have thinned out by the final year the size of the classes makes sound instruction impossible.

It would be preferable to improve basic education and create new schools of medicine in those areas where more physicians are needed. In this way it would be possible to select an adequate number of candidates likely with appropriate training to make competent physicians. The same applies to the field of paediatrics.

It was noted that there was a very definite problem in the small schools—one quarter of the schools had 22 paediatric students or less—since on account of the high cost per student there was great difficulty in finding the necessary funds for complete and well organized courses in paediatrics.

#### *Time devoted to the subject*

The hours devoted to the teaching of paediatrics varied from 72 to 468 the first quartile being 150 the median 225 and the third quartile 330. Although it is not easy to establish a minimum number of hours it is obvious that most of the schools were giving too little time to a subject which takes up at least one third of the general practitioner's working hours. The Study Group on Paediatric Education convened by WHO in 1956 suggested 300 hours as a minimum and expressed the view that "for adequate coverage more hours were necessary and the allocation of one quarter of the clinical time to paediatrics was envisaged as a reasonable

proportion"<sup>3</sup>. Of the chairs surveyed 65% did not allot this minimum time to the subject. Those devoting more time to it followed present-day educational tendencies by stressing practical work whereas elsewhere paediatric instruction mainly took the form of academic and clinical lectures to large groups.

Sixteen chairs (more than 20%) did not provide for any individual work with patients in hospitals or out patient clinics. 11 others had facilities for practical work in the hospitals only. This means that for almost 40% of the paediatric departments or courses there were no facilities for individual work with out patients—an essential part of paediatric education since it is one of the best ways of learning about child growth and development and about the common problems that arise in practice. In this connection the WHO Study Group on Paediatric Education agreed that the drama of the acutely ill child in the hospital provides fundamental teaching experience but on the other hand the day-to-day problems in the out patient department are fundamental too because they are typical of what the practitioner will encounter in his later career. It was noted that heads of departments are often reluctant to spend much time on out patient teaching yet an experienced teacher may make out patient problems as stimulating and exciting as ward visits. In the out patient department the student again should work as a physician but here also he must be carefully checked by an experienced doctor who can thus demonstrate how to deal with children and their parents. Properly handled this is guided independence"<sup>4</sup>.

Of the chairs devoting less than 300 hours to the teaching of paediatrics 13 (about 50%) made no provision for practical work the instruction they gave was thus found to be inadequate.

Information was available from 47 chairs on the proportion of time spent on paediatric instruction in relation to that taken up by the medical curriculum as a whole. For

WHO *Wkly Dig. Techn. R. p. Ser.* 1957 119 6

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there was a tendency to substitute for this praiseworthy traditional custom a system whereby newborn infants are installed in separate nurseries. In some cases there were no modern incubators or oxygen installations and in others owing to lack of washbasins aseptic precautions were neglected.

The library services—a most important element in paediatric training today—were unsatisfactory in most of the schools visited although in a few they were excellent. Very few libraries were adequately provided with basic paediatric works for consultation by students and works in Spanish and Portuguese were very scarce. There was an obvious need for competent librarians capable of organizing the basic reference works and journals and keeping them up to date.

### *Paediatric faculties*

It is not always an advantage for the professorship in a particular subject to be held by a leading specialist because specialists are not necessarily good teachers and moreover are generally too busy to devote much time to teaching. The best way of ensuring high quality and continuity in the teaching of a subject is to have a group of professors devoting their whole time to the work.

One of the greatest handicaps to paediatric teaching in Latin America is that in many schools the subject is taught in the few hours the professors can snatch from their private practice. Their remuneration—when there is any—is very small and they cannot be asked to make further sacrifices. If really good training is to be achieved professors will have to be given adequate salaries.

The circumstances varied considerably from place to place but as a rule the professors devoted only a very small part of their time to teaching paediatrics. In order to establish a ratio between the number of hours and number of students the total hours of all members of the teaching staff were divided by the number of students and this gave a maximum of more than 274 hours and a minimum of less than 1 hour per student. The median for the 56 chairs

supplying these data was 26 hours of class work per student. This small time allotment and the shortage of professors prepared to teach full time are important obstacles to good paediatric training for many of the teachers are excellent and have received modern training in paediatrics.

In most of the countries concerned paediatrics is understood as covering all the medical aspects of childhood from birth to the end of adolescence but in others there are somewhat confusing subdivisions. Some schools have one chair for puericulture and early infancy and another for clinical paediatrics so that an arbitrary dividing line is drawn between infants and older children. It is not advisable to separate puericulture from paediatrics as a whole because the growth development and care of the normal child are better understood when studied in relation to all other aspects of paediatrics.

The survey confirmed that research work is essential to good training but unfortunately few paediatric departments were undertaking such work—in most cases because they were without suitable equipment and full time staff.

### *Other teaching activities*

The study included a questionnaire on the methods employed for history taking, physical examination and subsequent medical treatment. Analysis of the data obtained showed that a considerable percentage of the students had some experience in these fields. On the other hand laboratory work—which is obviously invaluable in helping the student to obtain a clearer picture of the biological evolution of disease—was largely neglected.

In some departments and hospitals the groups of students were too large for satisfactory instruction; many of them confined themselves to observation; they were given theoretical explanations concerning diagnosis and treatment instead of taking an active part under close supervision in the establishment of clinical histories, in physical examinations and in analyses—activities which

these chairs the median was 43% with variations from 6.9% to 15%. Nearly all the schools in which the percentage was over 5 were giving more than 300 hours to paediatrics. A surprisingly large number of schools had no accurate records in this connexion. As a rule paediatrics was included in the last year of the medical curriculum; there were only 12 schools in which the course was of two years' duration and in only one was it spread over three years.

#### *Available teaching facilities*

In the study of essential facilities for the teaching of paediatrics attention was centred chiefly upon the number of hospital beds available, the quality of the facilities offered in the hospitals and the libraries.

It was found with respect to 73 paediatric chairs that the proportion of beds available for practical work was generally adequate to provide sufficient clinical material even though distribution was extremely variable, ranging from 690 beds in one case to none at all in four—which meant that a total of 820 students apparently had no contact whatever with hospitalized children.

It is usually considered that the student of paediatrics should attend at least 10 patients during his practical course in the hospital and double that number in the out-patient clinics. This is usually possible when there is an over-all ratio one of bed per student. About one third of the chairs had fewer beds than this at their disposal and one half had more than two beds per student. When there are too many patients to attend to, less time is spent on the actual teaching. The teacher is obliged to hurry over each case and this tends to confuse the student as well as setting him a bad example.

A sufficient number of beds reserved for communicable disease cases was generally available for hospital practice, since in Latin America communicable diseases play a predominant role in morbidity and mortality. Nevertheless, of the schools disposing of hospital beds, 20 did not reserve any specifically for patients with communicable diseases. It is possible, of course, that the students did

practical work on communicable diseases in other services.

In certain hospitals the placing of children in the general wards for infectious cases resulted in neglect of the paediatric aspects of the disease process and of the special needs of the children as growing persons. It is important to group infectious cases by type of infection and every precaution should be taken to prevent children with communicable diseases from transmitting them to others—without of course losing sight of the fact that communicable diseases are so common in childhood that every child is a potential source of infection.

It was found that the emotional problems of the hospitalized child require much more attention even though this aspect may be less immediately obvious than the diagnosis and treatment of organic disease. Children often find hospital life cold and impersonal compared with the warmth of family life. Their emotional adaptation is an important element in their recovery and also helps the physicians and students who are taking care of them.

In many of the hospitals visited the registers were kept in an unsatisfactory and incomplete manner and the laboratory services were considered inadequate. The surgical and radiological installations on the other hand were as a rule quite satisfactory. The social services were particularly deficient and only in a very few hospitals was any real attempt made in the teaching programme to co-ordinate the medical work with any form of social investigation.

It was also noted that few centres were effectively applying modern rehydration and electrolyte therapy with the result that students were not receiving sufficient instruction in this field. This is particularly unfortunate since in practically every part of Latin America there is a great deal of acute infant diarrhoea and malnutrition accompanied by dehydration and electrolyte disequilibrium.

Although the system of having mothers and newborn infants in the same room (rooming-in) is fairly general practice, teachers did not lay sufficient emphasis on the psychological implications. In fact

from the adult Paediatric education if it is to be complete must cover the newborn infant the healthy child public health services for children and all the other activities mentioned in Tables 2 and 3 it must not be confined to theoretical instruction but should include case observation and practical work

Quite a number of schools did in fact cover some of these aspects but far too little attention was being paid to public health services for infants and children or to services for crippled children and those with psychological and psychiatric problems Only 25 chairs had child health centres available for teaching purposes and in some cases no use was made of the abundance of excellent material available at these centres for the study of the growth development and psychology of the healthy child and of ways of dealing with family problems There is no doubt that because of its preventive value the correlation of paediatric education with community health activities is of the highest importance

Only five chairs made any attempt to use school health services which are a rich source of material and permit almost continuous observation of cases with the valuable collaboration of the teachers It would be advisable for students to pay more visits to the homes of children attending the clinics this would give them a closer insight into the social and environmental factors in children's diseases

Very few chairs (26) made use of data provided by public health nurses or social workers—valuable auxiliaries who are both able to help in solving complicated diagnostic problems and to facilitate treatment and subsequent observation

Finally the survey once again revealed the necessity for better instruction on all matters relating to the emotional and psychological aspects of childhood and family life it also served to stimulate critical self evaluation and efforts to achieve a real and lasting improvement in paediatric teaching in Latin America

## *Reports of Expert Groups*

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### FLUORIDES AND DENTAL HEALTH

The controlled fluoridation of drinking water to prevent dental decay is today being carried out on a large scale Twelve years after the first experiments in this field more than 30 million people in the United States are using drinking water to which fluorides have been added, while local fluoridation programmes are in operation in some 15 other countries

The value and advisability of this health measure have been the subject of lively controversy More than 3000 research publications have been devoted to fluoridation and the contradictory nature of some of their conclusions must be a source of confusion to public health authorities The publication

by WHO of the report of the Expert Committee on Water Fluoridation<sup>1</sup> which discusses the advantages possible dangers and technical problems of the method therefore fulfils an urgent need

#### Controlled fluoridation

The keen interest aroused by this preventive method and the speed with which it has been adopted can be readily understood when it is remembered that dental caries is prevalent in all countries in every walk of life and

<sup>1</sup> WHO Expert Committee on Water Fluoridation (1955) *Report (Wld H. A. Org. tech. Re. Ser. No. 146)*, 25 pages. Price 19 \$0.30 or 5 s. 1 Also published in French and Spanish.

would develop their diagnostic powers and ability to decide on treatment

Referring to the lecture method the WHO Study Group on Paediatrics in its report expressed the view that the method is ideal for original presentation of certain aspects of basic paediatric material for instance growth and development psychological problems relation to public health indices A well planned lecture sets the stage for work with individual patients and helps to balance the student's education On the other hand the Group noted the danger of over use of the lecture method as being the easiest way out when there are few teachers and large groups of students and the objective is merely complete coverage of textbook material Another potential danger is the passive and receptive role of the student A premium may be placed on the ability merely to memorize facts<sup>5</sup>

The paediatric curriculum in Latin America placed great emphasis on the diseases peculiar to infancy and on the symptoms of some general maladies There should be some modernization here to bring teaching into line with the present day concept of

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**TABLE 2 NUMBER AND PERCENTAGE OF LATIN AMERICAN SCHOOLS OF MEDICINE PROVIDING INDIVIDUAL TRAINING IN PRACTICAL ASPECTS OF PAEDiatrics IN 1956**

Activity	Number	Percentage
Interviews with parents	59	86.8
Case histories	64	94.1
Examination of patients	67	95
Laboratory work	28	42.4
Methods of treatment	64	94.1
Demonstrations (operations and special techniques)	55	81
Case observation	64	94.1

The number of paediatric chairs giving specific data varied from 66 to 68

paediatrics as the branch of medicine dealing with all aspects of child health including growth and development prevention treatment psychological and emotional factors affecting the child patient and his family and the relationship of the child to his environment Students should be made to understand that above all it is the process of development within the child—and not merely weight or size—that differentiates him

**TABLE 3 NUMBER AND PERCENTAGE OF PAEDiatric CHAIRS IN LATIN AMERICA PROVIDING TRAINING IN SPECIALIZED BRANCHES OF PAEDiatrics IN 1956**

Branch	Lectures		Case observation		Practical work	
	number		number	/	number	
Growth and development	64	92.8	52	80.0	40	60.6
Normal newborn infants	63	9.6	54	83.1	47	72.3
Infants and healthy children	64	92.8	49	76.6	42	64.6
Public health services for infants and healthy children	38	5.9	27	41.5	26	38.8
Premature infants	64	92.8	3	80.3	43	65.2
Handicapped children	34	53.1	31	100	22	34.9
Children with psychiatric and psychological problems	34	49.3	27	40.9	20	29.9
Communicable diseases	60	87.0	55	83.3	46	68.7

The number of paediatric chairs giving specific information varied from 62 to 69

harmless in the optimal preventive concentration it is essential to ensure that they have absolutely no harmful cumulative or long term effects before authorizing the controlled fluoridation of an urban water supply since such a measure will lead to the continual daily ingestion of fluorides by a large population

A thorough toxicological study of the fluorides has in fact been in progress for some time. Tests carried out on experimental animals have revealed certain forms of poisoning involving the bony structure and the kidneys in particular but these morphological or functional changes occurred only after the administration of doses 50 to 200 times higher than the optimal preventive concentration. Furthermore detailed studies of the ingestion and excretion of the fluorides and above all their metabolism—an essential factor in assessing toxicity—have failed to reveal any suspicious biochemical process. Finally observations made in the United States in certain communities where drinking water has a natural fluoride content considerably exceeding the preventive dose have shown that this high natural content has no harmful repercussions on public health and that growth morbidity and mortality rates in the areas concerned differ in no way from the normal.

In conclusion the Committee was of the opinion that the results of this extensive and thorough enquiry prove beyond doubt the safety of controlled fluoridation as a public health measure.

## Practical aspects

After the value and safety of controlled fluoridation had been satisfactorily proved it still remained to be seen whether it could be readily and economically put into practice. Experience over the last twelve years in waterworks already equipped for fluoridation shows that the process does not differ essentially from any other form of drinking water treatment such as chlorination etc. It raises no new technological problem and the cost of the necessary installations is reasonable even modest. In view of the toxic properties of fluorides it is obvious that certain precautions should be taken. The mixing equipment should be planned in such a way as to exclude the danger of overdosage and the fluoride content of the water treated should be carefully and regularly checked by qualified staff.

It is clear that the necessity for a well equipped waterworks as well as frequent and regular controls limits the use of the method to well-organized water supply systems and that this will deprive very large population groups of its benefits. Other means considered for supplying the body with additional fluoride include the local application of fluorides to the dental enamel, the regular consumption of food with a high fluoride content and finally the administration of fluoride tablets. Should these methods prove effective they will be very useful in regions where the controlled fluoridation of drinking water is not yet practicable.

## NEW STANDARDS FOR ANTIBIOTICS HORMONES AND VACCINES

Information on a number of new biological standards and the corresponding international units is given in the eleventh report of the WHO Expert Committee on Biological Standardization which has just been published. In addition the replacement of several standard preparations of which

supplies are insufficient is discussed. The report also shows the special attention that is now being paid to the establishment of international standards for certain vaccines. The following points from it may be of interest to biologists and clinicians.

### Antibiotics

The International Standard for *Tetracycline* has been established. It contains

WHO Expert Committee on Biological Standardization  
(5) *Errors for (1) A Dr An R Ser N 14*  
34 rev. Price 1.9 \$0.30 or 5 f 1 Also published in French  
and Spanish.



at all ages and that its treatment is a heavy burden on both public and private budgets. Loss of teeth and the resultant impairment of mastication may have serious repercussions on digestion and growth. Bad teeth are also a social handicap and as such can be the cause of psychological difficulties.

Despite recent advances in dental medicine it is clear that the treatment of caries—always relatively expensive and often impracticable owing to a shortage of qualified personnel—can be no solution for the problem taken as a whole. The preventive measures so far advocated—dental hygiene, diet with supplementary vitamins, etc.—have generally not given the hoped for results and are difficult to apply on a large scale. Thus until the preventive effects of fluorides were discovered, public health authorities had practically no means of combating dental caries.

Although the empirical use of fluorides for the prevention of dental caries goes back nearly a century, our present knowledge of their biological effects is due to the work of McKay and Dean on the dental disease known as mottled enamel, for which a high concentration of natural fluorides in drinking water was found to be responsible. Their research revealed incidentally that resistance to dental caries in communities where mottled enamel was endemic seemed to be very much above the average. This finding led to a new line of research and investigation of the preventive action of fluorides in the field of dental health was immediately started in the United States.

There were many factors facilitating such investigation: the large number of communities living in areas where the water contained natural fluorides; the range of concentrations found in such areas; and the ease with which communities could be grouped according to their sources of water supply. Careful examination of thousands of school children in some twenty American cities definitely showed that the prevalence of dental caries was within certain limits inversely proportional to the natural fluoride content of drinking water. Similar surveys in a number of other countries subsequently

corroborated these results, confirming the preventive action of fluorides and indicating that the optimal preventive concentration was about 1 part per million. Certain countries thereupon decided to take practical steps and experiments in the controlled fluoridation of drinking water were started in 1945 in the United States at Grand Rapids (Michigan) and Newburgh (New York State) and then in Canada at Brantford (Ontario). These pilot experiments were planned for a period of ten years so as to cover not only the primary dentition but most of the permanent dentition of a number of the younger children involved. The economic and technical aspects of controlled fluoridation were studied as well as its prophylactic effects. The results of these experiments compared with data from two groups of control areas showed that fluorides added to water at the optimal concentration had exactly the same preventive action as those occurring naturally. The prevalence of dental caries among children who had been drinking the treated water since birth was 50% to 60% lower than in the control groups. Furthermore, very thorough paediatric examination both before and after the experiments showed that at this concentration controlled fluoridation had no toxic effects even after a period of ten years.

#### Safety of water fluoridation

Although the ability of fluorides to prevent dental caries is no longer questioned, their safety is still widely doubted. The Expert Committee has endeavoured in the light of the most recent information to give an objective summation of this controversial question, which is dealt with in the second part of the report.

Fluorine, which is found in the form of natural compounds in almost every part of the globe, is also present in the skeleton and the teeth as well as in a certain number of basic foodstuffs. It is essential for the body, particularly during growth, but it is known that very heavy doses can have certain toxic effects. Although fluorides appear to be

suggested by the WHO Expert Committee on Yellow Fever Vaccin.<sup>3</sup> The Statens Serum institut holds and will distribute this serum.

## Hormones

*Oxytocic vasopressor and antidiuretic substances* The International Unit of each substance is defined as the activity contained in 0.5 mg of the International Standard.

The attention of WHO has been drawn to the desirability of establishing international standards for *human menopausal gonadotrophin* and *relaxin*. The second standard for *prolactin* and the fourth standard for *insulin* are in course of preparation.

Wld Hlth Org. An. Rep. Ser. 1957 134 3

The report also contains material on *inter alia* pyrogens, heparin, vitamin B<sub>12</sub>, dextran sulfate, rabies vaccine, swine erysipelas vaccine, leptospirosis vaccines and sera and cardioplin.

The International Laboratories for Biological Standards at the Statens Serum institut, Copenhagen, and at the National Institute for Medical Research, London, are custodians of all International Biological Standards and Reference Preparations and distribute samples of these preparations free of charge to national laboratories for biological standards in all countries.

A list of these standards and preparations with bibliographical references for each of them is given as an annex to the report.

## Notes and News

### A step towards mass protection against malaria

With the disturbing realization that each year more and more of the mosquito carriers of malaria are developing resistance to the powerful insecticides that once destroyed them so effectively, the race to interrupt transmission in malarious areas before resistance sets in among the local insect vectors is increasing steadily in urgency. Moreover, unless transmission is maintained at a low level, there will always be a danger that the disease may become rampant again in areas where it has up to now been successfully controlled with insecticides.

One of the surest ways of interrupting transmission is to prevent the malaria parasite from developing in the human host by treating the people at risk with an anti-malarial drug. But while this is comparatively simple where individuals or specialized groups of people, such as schoolchildren or service personnel, are concerned, it is no easy matter where complete populations require protection. Quite apart from any economic considerations, the practical problems involved would rule out the large scale administration of a malaria suppressive in tablet

form. A few years ago, however, it was suggested that if the suppressive could be added to some universal article of diet—salt, for instance—in the same way as iodine is incorporated in salt for the purpose of controlling endemic goitre, mass protection could be achieved without undue difficulty. This suggestion aroused immediate interest and an investigation was undertaken to determine the efficacy of chloroquine and pyrimethamine medicated salt as a suppressive against sporozoite-induced vivax malaria (Chesson strain). The results of this investigation, which was carried out in the USA under an agreement between the Public Health Service of the US Department of Health, Education and Welfare and the World Health Organization, have just been published in the WHO Bulletin.<sup>1</sup>

The first question to settle was the stability of the drugs under the conditions likely to be met with during storage and cooking. Once it had been established that both substances remained remarkably stable under these conditions, attention was turned to the

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1. See also G. R. McKelsen, O. Burgess, R. W. Young, I. D. A. Parker, C. I. (1957) *Bull. Wld Hlth Org.* 19 53.

990 units per mg the unit being practically equivalent to one microgram of tetracycline hydrochloride

The International Unit for *Erythromycin* which has also just been established (0.001053 mg of the International Standard) is equivalent to one microgram of pure erythromycin base

The International Unit for *Phenoxymethyl penicillin* has been defined as the activity contained in 0.00059 mg of the International Standard

Preliminary studies of an assay method for *PAM* (procaine benzylpenicillin in oil with aluminium monostearate) have now been completed. Two batches producing fairly high concentrations of penicillin in circulating blood are available in sufficient quantity to serve as international reference preparations. In view of the importance of this drug which is largely used in campaigns against treponematoses a collaborative assay will be undertaken in man and in rabbits.

The collaborative assay of the proposed international standard for *neomycin* is in progress.

## Antigens

The International Standard for *Pertussis Vaccine* has been established and the International Unit is defined as the activity contained in 1.5 mg of the International Standard. Owing to the inexactitude of current assay methods great care should be taken in appraising the immunizing potency of a pertussis vaccine.

Work is continuing on the development of stable *typhoid vaccines* in sufficient quantities for future field trials<sup>2</sup> for laboratory assays and for the subsequent establishment of an international standard for typhoid vaccine.

The prophylactic value of *cholera vaccine* is now generally recognized. There is still no evidence, however, that a vaccine which has given good results in the laboratory will be effective in practice. Concurrent field and laboratory studies will therefore have to be carried out in an endemic area on a fairly

large scale and the possibility of arranging for such studies is being examined.

The behaviour in various assay methods of different freeze dried *smallpox vaccines*—including the proposed international reference preparation—will be the subject of a collaborative study. The Committee noted reports on the assay of the potency of smallpox vaccines by intracutaneous injection into rabbits and on the use of tissue culture methods to determine the virus content of such vaccines.

In several countries efforts are being made to obtain a stable dried trivalent *poliomyelitis vaccine* which would serve as a reference preparation. It seems that certain preparations offer a satisfactory degree of stability. Collaborative stability studies will be organized by the Statens Seruminstitut Copenhagen in various laboratories. There is urgent need for a stable standard since this would facilitate the development of improved methods of potency testing.

## Antibodies

The albumin potentiated anti Rh<sub>0</sub> (anti D) blood typing serum proposed as an international standard is the subject of a collaborative study on the completion of which the international unit will be defined. It has not yet been possible to obtain adequate quantities of agglutinating (saline agglutinating) anti Rh<sub>0</sub> (anti D), anti rh (anti C) and anti rh (anti E) sera for use as international standards.

Lyophilized human monkey guinea pig and horse *poliomyelitis sera* will be compared with the proposed international reference preparations in order to determine whether the latter are suitable for use in tests of the virus neutralizing potency of sera from different animals. These indispensable reference sera are urgently needed for research purposes.

Steps have been taken to produce sufficient quantities of *yellow fever immune serum* for the establishment of an international reference preparation for mouse protection assays. It did not seem appropriate, however, to establish a reference preparation of non-immune (normal human) serum as was

<sup>2</sup>For details see p. 1 m. Any field trials see Ch. VII h  
O.S. 1956 10 153 and 1957 11 343

(unlike the poliomyelitis virus) is not transmitted by inter human faecal contamination

The figures for town dwellers quoted in the paper confirm that Mengo encephalomyelitis may persist even in temperate regions and that the source of infection unlike that of poliomyelitis is extra human. Rats or other species of forest rodents in whose faeces and urine the Mengo virus is plentiful are thought to be the vectors. The disease spreads more easily where dwellings are primitive and badly protected as among the pygmies who live in huts made of leaves

#### DDT resistance in *Anopheles stephensi* in India

The emergence of strains of *Anopheles stephensi* resistant to DDT has now been reported from India as well as from the Eastern Mediterranean area.<sup>2</sup> A preliminary note published in 1956<sup>3</sup> indicated that the larvae of *A. stephensi* (type form) were developing resistance to DDT in Erode town Madras and this has recently been confirmed by Dr B. A. Rao, Director of the Malaria Institute of India. DDT has been in use in Erode town as a larvicide in wells since 1947 and as a residual spray on wall surfaces of wells since July 1956. In November 1957 a team from the Malaria Institute carried out tests on the susceptibility of *A. stephensi* larvae and adults. The larvae were found to be about 1000 times as resistant to DDT as specimens which had not been exposed to the insecticide whereas the adults were much less resistant (minimum lethal concentration of DDT 3.16%). A similar phenomenon has already been observed in *Aedes aegypti* and in both cases the development of resistance followed the prolonged use of DDT as a larvicide.

Indications of a diminished susceptibility to DDT in *A. stephensi* have also been reported from Mysore State.<sup>2</sup> In a series of susceptibility tests 278 / survivors to 2 / DDT were found. Although it is not stated which form of *A. stephensi* was tested

the fact that the work was done in the rural areas of Mysore suggests that it was the variety *Mysorensis* a form commonly found in rural areas. It therefore seems likely that resistance is not restricted to the type form usually found in the towns.

Some experimental studies recently reported<sup>4</sup> suggest that in *A. stephensi* continued exposure to DDT results in "the selection of a factor or a number of factors other than a specific gene for resistance imparting an increased tolerance to the insecticide". Such factors might be for instance a thicker cuticle less permeable to the insecticide or a larger fat body where the insecticide could be stored without reaching the nervous system. This is the phenomenon for which the term "vigour tolerance" has been suggested.

#### Yaws control in the face of tribal taboos

A nation wide mass campaign against yaws was started by WHO in Liberia on 1 January 1955. Previously Liberia was an area of high endemicity with an infection rate of 24-48% in the Central Province and 6-11% in the Western Province. WHO policy is to recommend mass treatment whenever the prevalence of clinically active yaws in a community is over 10%.

In a total population estimated at 750 000 there are in Liberia 20 indigenous tribes belonging to three distinct ethnological groups as well as about 16 000 Americo-Liberians whose ancestors were freed slaves from the USA. As each tribe has its own beliefs superstitions and tribal laws the problem of organizing a mass campaign and recruiting and training the necessary personnel was even more complex than usual. Dr E. G. H. Bendel, formerly Chief Medical Officer World Health Organization, Liberia describes the problem in the following words:

"One of the main difficulties of the yaws campaign in Liberia lay in the fact that the approach of the teams had to be altered according to the customs and beliefs of practically every province. For instance it was

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R. J. Gopalan, N. Vedamanickam, J. C. A. R. moor H.

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Shama Sastri H. Sastaram, N. L. A. Rama Rao T. S.  
119 & Indian J. Malor 10 34

Davidson, G. (1955) Bull. Wild Hlth Org. 18 579

important problem of determining the correct amount of drug to incorporate with the salt. Since the required amount must depend on the amount of salt consumed by the people to be treated it was clearly necessary to ascertain the average daily salt consumption of the subjects to be used in the medicated salt tests—volunteers of military age in the US Penitentiary at Atlanta, Ga. The investigators evolved a simple method for estimating the salt consumption based on the daily urinary chloride excretion of the volunteers and in the light of the result obtained decided on a dosage of 300 mg of chloroquine or 25 mg of pyrimethamine per 50 g of salt.

The next problem was to prepare uniform stable drug salt mixtures. This was not an easy task but eventually satisfactory procedures for both drugs were worked out. The mixtures used in the tests were indistinguishable in taste and appearance from ordinary salt and were entirely acceptable to the volunteers.

The results of the tests are very encouraging. Malaria was completely suppressed throughout the medicated salt regimen (41 days for chloroquine, 45 days for pyrimethamine) and for 28-43 days thereafter in all the test subjects even though they were exposed to three large doses of sporozoites (10 heavily infected mosquitos per man). In contrast malaria parasites were demonstrable 13-15 days after exposure in the blood of the untreated control subjects who were exposed to the same infective doses.

The tests outlined above were carried out on only a small scale (8 drug treated subjects in each case and 4 or 5 controls) but the results lead one to hope that the method will prove to be of value in particular programmes aiming at malaria eradication.

### Encephalomyelitis and poliomyelitis

The etiology of encephalomyelitis of the Mengo type is still obscure. The main reservoir of the viruses of this group, their geographical distribution and the way in which they are transmitted are all unknown factors. It has yet to be established whether inter-human contagion with these viruses occurs

as in the case of the poliomyelitis Coxsackie and ECHO viruses. Many epidemiological and clinical data suggest a close relationship between poliomyelitis and Mengo encephalomyelitis, and in fact the two complaints have often been confused. Nevertheless certain findings—in particular cytological changes in the infected tissues—differentiate the diseases from one another.

In a paper which recently appeared in the *Bulletin of the World Health Organization*<sup>1</sup> G Barski and F Cornefert reviewed the results of a serological survey to determine the relationship between these two groups of viruses. For the purposes of this study the distribution of the specific antibodies of Mengo encephalomyelitis was investigated among 362 Africans in the Belgian Congo (including 165 nomadic pygmies living near the area where the Mengo virus was isolated for the first time), 78 Europeans and 83 Uruguayan children from Montevideo and neighbourhood. In a previous paper the same authors in collaboration with P Lepine described a search for poliomyelitis antibodies in the same sera.<sup>2</sup>

About 33% of the Africans (44% of the pygmies, often young children) were found to carry the Mengo neutralizing antibody, so were 6 of the 78 Europeans—including one child—and 4 of the 83 Uruguayan children. The results led to the conclusion that a primitive mode of life and proximity to the tropical forest are factors favouring contamination with the Mengo virus.

Whatever the proportion of subjects carrying Mengo virus antibodies, it is always less than the proportion carrying poliomyelitis antibodies which moreover increases with age, reaching 80-100% among adults over 20 years old. Among negroes in two isolated villages in the mountainous area the proportion carrying poliomyelitis antibodies was 89%, 67% and 72% respectively for each of the three types, while only 18% carried Mengo virus antibodies. These facts strengthen the assumption that even in the most favourable conditions the Mengo virus

<sup>1</sup> Barski, G. & Cornefert, F. (1957) *B. H. W. J. H. O. R.* 17  
<sup>2</sup> Barski, G., Lepine, P. & Cornefert, F. (1956) *B. H. W. J. H. O. R.* 14, 119.

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The health programme of the school was developed by two WHO public health nurses in co-operation with Thai medical staff. Miss Maire Hälönen, the first of these

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In the first year of training a course of forty lectures is given to all students to explain the general health situation in Thailand and to show how the particular tasks of each of the other workers on the team are linked with those of the health worker. For example, the agriculture and health workers are both concerned with hygienic composting. The training given to the students specializing in health work includes lectures, demonstrations and six months' field training. During the period of field training the students live in the villages and with the help of the villagers undertake such tasks as the building of latrines and the improvement of wells and sewage disposal facilities. They also hold home nursing, first aid and baby care classes.

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soon discovered from hearsay as well as from experience that people in the western provinces are rather backward superstitious and living under constant control of devils with whom they communicate by means of numerous secret societies. The most influential are the Poro bush society, the Water society and the Crocodile and Snake societies. Each one of them possesses its own particular rules and taboos strictly followed by its members and to which the slightest derogation would undoubtedly entail the death of the member involved. These local laws are kept strictly secret and we could hardly learn of them by means of carefully carried out investigations and gifts. We discovered for instance that it was forbidden to enter some of the villages with shoes. In others it was not allowed to burn palm oil. In Gio country people do not eat chicken while in Bassa country where the Snake society has its followers it is strictly forbidden to kill any kind of snakes. Before entering a town our teams had to be necessarily aware of such rules and to follow them inasmuch as the slightest violation would have frustrated their work.

Despite these difficulties the campaign was carried through successfully and by 15 December 1956 when the resurvey was completed the total prevalence of yaws cases had dropped from 60-70% to 1.53% and the rate for infectious cases from 2.4% to 0.204%. The hyperkeratosis rate—the most important index of the success of the campaign—had fallen from 50.60% to 1.3%. During the campaign 701 661 people were seen and treated in three districts in Liberia. The attendance reached 95% of the population surveyed—the figure which had been set as a target at the outset of the campaign.

#### Local treatment of wounds to prevent rabies

Although it cannot take the place of prophylaxis the local treatment of wounds caused by the bites of rabid animals can prevent or retard the penetration of the rabies virus and is therefore a useful first aid measure.

Nitric acid and soap solutions have been

used in this connexion for some time. More recently the use of detergents (Zephuran chloride and Terjolate) and the infiltration of antirabies serum under the wound have been advocated. Experiments have been made with animals in which wounds were produced artificially and infected with rabies virus by means of forceps. An initial study on the subject was published in the *Bulletin of the World Health Organization* in 1954<sup>1</sup>. The results of further experiments recently appeared in the same publication<sup>2</sup> and may be summarized as follows.

Nitric acid applied within 4 hours gave protection in experimental animals but was ineffective after 24 hours. These results confirm the findings of other workers.

Antirabies serum also proved effective both when infiltrated under the wound and when inoculated systematically up to 24 hours after infection, this being the longest interval tested. The results suggest that the serum exercises a specific local action. The detergent Terjolate when applied by gentle swabbing or by infiltration of saline solution under the wound up to 3 hours after infection was distinctly less effective than nitric acid or serum. The excellent results obtained with Zephuran chloride point to the need for further studies on this and similar substances less corrosive than nitric acid.

The experiments confirmed the value of simple washing, flushing or irrigation of wounds as a means of reducing virus levels below the infective dose.

#### Nursing education in Pakistan

In 1952 a WHO/UNICEF assisted nursing education project was started at the Medical College Hospital and School of Nursing, Dacca, East Pakistan. Its aim was to strengthen nursing in East Pakistan by providing more nurses by training nurses as instructors and administrators by revising the curriculum to meet the health needs of the people and by advising the Government on all matters pertaining to nursing. Teaching and

<sup>1</sup> Sh. Zhai, J. J. J. & Z. J. J. (1954) *B. W. H. O. J.* 10: 805.  
<sup>2</sup> Pere, Gallard, F., Zarco, E. & Kaplan, M. (1957) *B. W. H. O. J.* 17: 963.

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#### Leprosy control in Colombia

Under the terms of an agreement signed a few months ago between the Government of

Colombia and the World Health Organization a survey is to be made in that country of the incidence of leprosy the local characteristics of the disease and the facilities available for its control. The survey's findings will be used in the planning of a long term antileprosy campaign.

The preliminary survey and the subsequent campaign will be the direct responsibility of the Leprosy Section of the Colombia Public Health Department and WHO—under the terms of the Expanded Programme of Technical Assistance—will give technical assistance and advice to the campaign directors and award fellowships for specialization in leprosy diagnosis treatment and control.

### Intramuscular injections

The precautions to be taken and the procedures to be followed when giving intramuscular injections are well known but they are not always satisfactorily observed under conditions such as those met with in mass treatment campaigns against the treponematoses nor is the importance of employing uniform techniques always sufficiently appreciated. In a paper shortly to be published in the Bulletin of WHO Dr C J Hackett and Dr C W Gockel of the Venereal Diseases and Treponematoses Section World Health Organization present a brief review of the recommended techniques and procedures covering all aspects of intramuscular injection from the choice and maintenance of equipment to the carrying out of the actual injection.

### Cholera epidemic in Thailand

At the request of the Government of Thailand 500 000 ml of cholera vaccine

have been sent to that country by WHO to help combat a cholera epidemic which had caused over 300 deaths by mid June. More than 2000 cases have been reported in Bangkok and 17 provinces. This emergency shipment was authorized after consultation with members of the WHO Executive Board.

This is the first cholera epidemic in Thailand for several years the last case reported there occurred in 1951 and there were 9 cases in 1949.

There are signs that the incidence of cholera in 1958 may be high the number of cases so far reported is double that for 1957 in East Pakistan (8900 as against 4000) and India (17 600 as against 8400). The disease has also been reported in Cambodia (2 cases) and Burma (4 cases).

### Death of Dr Emilie J Deltombe

It was with deep regret that her colleagues in the World Health Organization learned of the death of Dr Emilie J Deltombe of Belgium. Dr Deltombe was killed in a road accident in Nigeria where she took up her duties in January of this year as Maternal and Child Health Medical Officer at the On River Rural Health Demonstration and Training Centre.

A graduate of the University of Liege Dr Deltombe was in 1952 awarded a WHO fellowship for study in the United States where she obtained a Master's degree at the Harvard School of Public Health. Subsequently she worked for WHO as Maternal and Child Health Officer in Cambodia and in Calcutta, Egypt. Just before her assignment to Nigeria Dr Deltombe had prepared a plan of operations for a maternal and child health programme in Tunisia.

## People and Places

### Control of houseflies

WHO will shortly investigate reports from Liberia of an increase in the density of houseflies following the application of dieldrin in antimalaria operations. At the same time the suitability of current fly control methods in Liberian conditions will be investigated, and a long term programme for the control of houseflies established.

Dr Norman Gratz, of the United States, the entomologist in charge of these operations will be assisted by Mr J Skelly, a sanitarian from the United Kingdom. Dr Gratz has held the post of medical entomologist in the Division of Sanitation, Ministry of Health, Israel, for some years.

### Nursing training in Afghanistan

The newly appointed senior nurse educator on the WHO nursing team in Afghanistan—Miss Pamela M Smeeton of the United Kingdom—will assist the Afghan Government in planning and carrying out improvements in nursing education. Miss Smeeton, who holds a Sister Training Diploma from the Royal College of Nursing, London, has been Assistant Matron of the London Hospital since July 1956.

The WHO nursing team in Afghanistan provides courses at school for male nurses established in Kabul with assistance from the Organization as well as courses for female nurses and midwives. The curriculum lay special emphasis on training in public health work. Afghan nurses and midwives are gradually being prepared to continue the teaching programme when the WHO team leaves.

### Conference on occupational health

A conference on occupational health in South East Asia will be held in Calcutta from 24 November to 5 December 1958. It is being organized by the Indian Ministries of Labour and Public Health, with assistance from ILO and WHO for the purpose of reviewing the present situation of occupational health in South East Asia and planning co-ordinated programme for the future. The following countries will be represented: Afghanistan, Burma, Ceylon, India, Indonesia and Thailand.

Dr Leo Hoog of Finland recently went to India to help the WHO Regional Office for South East Asia in its preparatory work for this conference. Dr Hoog studied occupational health in the United States and was responsible for the organization of the Institute of Occupational Hygiene. He was President of the Ninth International Conference of Occupational Health, held in Helsinki in July 1957 and has

served on the Joint ILO WHO Expert Committee on Occupational Health.

### Rehabilitation work in Bombay

In 1957 WHO helped the Indian Government to establish an All India School of Physiotherapy in Bombay. A rehabilitation centre working in collaboration with this school and serving hospitals in Bombay State was set up three years later with the assistance of the United Nations Technical Assistance Administration and the World Veterans Federation. Dr F K Safford of the United States recently went to India to advise the WHO Regional Office for South East Asia on further assistance to this undertaking on the medical side.

Dr Safford, who has been Director of Physical Medicine and Rehabilitation in New York City Hospital for many years, has visited Austria, Greece, Spain and Yugoslavia, on behalf of WHO to advise on rehabilitation work.

### Health services and community development

As part of a community development plan covering the whole of India, WHO and UNICEF are assisting the Indian Government in fifteen States to develop preventive and curative health services and to train staff for rural health work. Dr Guillermo López de Nava was recently appointed Senior WHO Officer in the health project for community development areas in Bombay State. This project, which started off with maternal and child health activities in 1955, has now been expanded to include the establishment of health centres, the improvement of hospitals to which patients from these centres are referred, the establishment of laboratory diagnostic services and the general strengthening of rural health services.

Dr López de Nava qualified in public health at the Mexico School of Public Health and Hygiene in 1939, subsequently working on the development of rural health services in Mexico and as an epidemiologist. During the past twenty years he has served with the United Nations Relief and Rehabilitation Administration in Germany and with the United Nations Korea Reconstruction Agency.

### X-ray engineering in Taiwan

As WHO X-ray engineer in Taiwan, Mr R. Arthur Aham is making a survey of local X-ray facilities and training technicians in the installation and maintenance of mobile and static X-ray equipment. Mr Aham, who studied X-ray technology in England and the United States of America, has been Chief of the X-ray Engineering Services of Trinidad and Tobago since 1949.

In connexion with a WHO seminar on brucellosis held in Africa in June Dr Lois M Jones of the United States has prepared a study on bacteriological and serological methods in brucellosis control and an assessment of the results of recent vaccine trials in sheep and goats sponsored by FAO and WHO

A graduate of the University of Wisconsin Dr Jones was until recently engaged in research at the WHO/FAO Brucellosis Centre Weybridge England

#### Maternal and child health services in Viet Nam

Miss Elizabeth E Barton of the United Kingdom has joined the staff of the WHO assisted maternal and child project in Viet Nam as nurse educator. She will work with the Government to develop maternal and child health services and will help to train local personnel. Miss Barton who has been with WHO since 1953 comes to Viet Nam from a similar assignment in Pakistan.

Dr Leonard Bruce Chwatt has been appointed Chief of the Planning Section of the Division of Malaria Eradication recently established at WHO Headquarters. A graduate of the University of Warsaw Dr Bruce Chwatt holds post graduate degrees and diplomas from the State Institute of Hygiene Warsaw the University of Paris the London School of Hygiene and Tropical Medicine and the Harvard School of Public Health. He has had many years experience of antimalaria work in Nigeria where he organized the Malaria Service of the Nigerian Medical Department. Dr Bruce Chwatt was appointed to the WHO Expert Advisory Panel on Malaria in 1951 and in 1956 served as a member of the WHO Expert Committee on Malaria. In 1957 he was a member of the Malaria Evaluation Team in India sponsored by the US Government and the Rockefeller Foundation.

See Ch. *Wld Hlth Org* 1958 12 61

## Review of WHO Publications

*Insecticide Resistance in Arthropods* by A W A Brown Geneva 1958 (*World Health Organization Monograph Series* No 38) 240 pages Price £1 5s \$5 00 or Sw fr 15 —

The resistance to insecticides developed by many arthropods which are vectors of diseases affecting man and animals has lately become a public health problem of considerable importance and consequently of interest to the World Health Organization. WHO has just issued a monograph on this subject in which the author Dr A W A Brown Ph.D. Biologist Division of Environmental Sanitation WHO has drawn on all the sources available over the past decade comprising some 625 publications and much unpublished information to give an exhaustive account of this phenomenon.

The appearance history and geographical distribution of resistance is fully described and evaluated for each of the 40 odd species considered. In a very few instances the claims for developed resistance are shown to be

unfounded. The genetical origins and physiological mechanisms of resistance are treated fully in the light of all available research findings. In nearly all cases resistance appears to be developed by Darwinian selection of insects carrying the pre adaptations (genes) so that they become characteristic of the majority of the population surviving the insecticide treatments. There is little or no evidence for post adaptation—for example "habituation". The physiological mechanism in resistance to DDT is mainly due to an increased ability to detoxify the insecticide while the mechanisms of resistance to BHC, dieldrin and organophosphorus compounds are evidently more complex.

Resistance to DDT on the one hand and to BHC and dieldrin on the other have been shown to be two separate entities. Thus in many cases dieldrin or BHC can be used to control DDT resistant *Anopheles* mosquitos and vice versa. Compounds have been discovered that are more toxic to DDT resistant than to normal houseflies and thus may be expected to result in the development of

DDT susceptible strains from ODT resistant ones. By the use of standard test methods resistance can now be detected in the field as soon as it appears so that appropriate action may be taken without delay.

By elucidating the process whereby resistant strains are developed and distinguishing between different types of resistance research workers have indicated the lines along which it can be counteracted. WHO has been entrusted with the role of co-ordinating the information already gained and stimulating and augmenting further work on this urgent problem.

*Excreta Disposal for Rural Areas and Small Communities* by E. G. Wagner and J. N. Lanoux. Geneva 1958 (*World Health Organization Monograph Series* No. 39). 188 pages. Price £15s. \$5.00 or Sw fr 15.— French and Spanish editions in preparation.

Waste matter of whatever origin has always constituted a real or potential source of danger to the health of man although he long remained unsuspecting of the importance of treating wastes so as to render them innocuous. The risks inherent in radio active wastes have recently caught the popular imagination and have caused great concern to many but there is also a far older though less spectacular problem which is nevertheless of prime importance—that of safely disposing of human and animal excreta which have been responsible for untold disease over the ages. Although such wastes are sometimes satisfactorily disposed of in urban areas they continue to be a menace in many rural areas the world over.

This new WHO monograph is designed as a practical handbook for use in tackling this problem. It attempts to deal comprehensively with a subject which has generally been covered only in part to provide specific technical information on suitable types of sanitary installation for rural areas and small communities and at the same time to give due consideration to the social and psychological factors involved in changing personal habits and in winning public support for

efforts to improve excreta disposal practices. It begins with a discussion of the public health importance of excreta disposal pointing out that in large areas of the world and indeed in parts of every country proper excreta disposal is among the most pressing health problems and that the solution of this problem brings economic and social benefits as well as improved health. It then turns to the matters of participation and responsibility in programmes for constructing sanitary facilities in rural areas and for educating the people in their proper use.

There is a major technical section dealing with the privy method of excreta disposal which is the method of choice in many of the rural areas of the world simply because the cost of water-carried methods often makes them economically impossible. Attention is given to factors which influence privy design and some of the basic considerations in excreta disposal are dealt with among them decomposition of excreta, quantities of human faeces, soil and ground water pollution, the location of excreta disposal facilities and engineering human and cost factors. This is followed by a brief discussion of the criteria for selecting a particular method of excreta disposal and a general description of the more common systems which are subsequently analysed in detail. Considerable space is devoted to the pit privy and the aqua privy the most universally practical and acceptable installations. Other less desirable types of privy described are the water seal latrine slab, the bored hole latrine and the bucket latrine, the *feuillée* or trench latrine and the overhung latrine. Also described are systems acceptable only in special circumstances—the compost privy, a means of conserving most of the fertilizing value of excreta with a minimum of health risks and the chemical toilet, an installation too expensive for use in most rural areas of the world.

There is also an informative section on water-carried methods of excreta disposal for rural areas, institutions and small communities in which septic tanks and the disposal of their effluent are discussed in detail. Among the subjects covered are prob-

lems in the disposal of water borne wastes the biological processes involved in the septic tank procedure the design of the septic tank system and effluent disposal methods including subsurface irrigation sand filter trenches sand filters and trickling filters

The last part of the monograph considers excreta disposal as a public health programme outlining the steps in planning such a programme and describing the training and functions of the sanitation staff which is to carry it out

This profusely illustrated study provides enough technical detail to be of assistance to those who are beginning their work in excreta disposal programmes in rural areas and at the same time offers some new ideas and approaches which may be of value to those with experience in trying to solve this very old problem The text has been reviewed by a considerable number of experts from many countries and their criticisms and suggestions have helped to make it a practical guide for public health administrators medical officers of health engineers engaged in health work and sanitarians

*Bulletin of the World Health Organization*  
1958 Volume 18 Number 4 (pages 481-684)

This recent issue of the WHO Bulletin is devoted mainly to papers on various aspects of insecticide resistance The mechanisms of resistance in *Anopheles gambiae*, *A. sinensis* and *A. stephensi* are discussed in a study by G Davidson based on the observation of laboratory colonies and material caught in the field Two distinct types of resistance were observed (a) DDT resistance with cross resistance to analogous substances but not to cyclodiene compounds nor to gamma BHC (b) dieldrin resistance with cross resistance to the other cyclodiene compounds and to gamma BHC but not to DDT It was found that a general

increase in tolerance to both groups of insecticides and to other insecticides of entirely different groups may be produced by prolonged exposures of apparently homogeneous strains to any of the insecticides

S Y Liu summarizes recent laboratory tests to discover whether resistance to DDT and BHC had developed among certain insects in Taiwan as a result of insect control campaigns which had been in operation since 1948<sup>1</sup> A similar investigation in French Guiana where spraying campaigns have been carried out since 1949 is described by H Floch and P Fauran who found that the *Culex fatigans* population at Cayenne had become resistant to BHC and dieldrin tolerating 20 times the normal concentrations while the *Anopheles asquahis* population has retained a very satisfactory susceptibility to DDT BHC and dieldrin

J R Busvine and W Z Coker contribute a paper on resistance patterns in DDT resistant *Aedes aegypti* while R H Wharton reports the finding of two further dieldrin BHC resistant strains of *Culex pipiens fatigans* in Malaya<sup>2</sup> Notes are included on insecticide resistance in houseflies (K R S Ascher) in body lice (J McIntoeck A Zenn & B Djanbaksh) in a Malayan strain of *Culex pipiens fatigans* (Marshall Land) and in a strain of the same species found in Penang (R H Wharton)

In addition to the papers on insecticide resistance this issue of the Bulletin contains the second part of the report by T P Pesigan and co workers on the WHO assisted pilot project for the control of bilharziasis japonica in the Philippines This part of the report deals with the biology of *Oncomelania quadrasi* the molluscan host of bilharziasis in the Philippines, and its relationship with *Schistosoma japonicum*

The list of contents will be found in the advertising section at the end of this number of the Chronicle

A summary of this paper appears in *Chron. Wild. Hlth. Org.* 1958 12 24

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## CORRIGENDA

Vol 12 No 5

### POLIO MYELITIS AND PUBLIC HEALTH

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### VENEREAL-DISEASE CONTROL IN THE WESTERN PACIFIC

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### REVIEW OF WHO PUBLICATIONS

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# BULLETIN

DE OF  
L'ORGANISATION MONDIALE THE WORLD HEALTH  
DE LA SANTÉ ORGANIZATION

Studies on *Schistosoma japonicum* infection in the Philippines 2 The molluscan host—*T P Pesigan N G Hairston J J Jauregui E G Garcia A T Santos B C Santos & A A Besa*

Studies in insecticide resistance in anopheline mosquitos—*G Davidson*

A summary of recent insecticidal tests on some insects of medical importance in Taiwan—*S Y Liu*

Resistance patterns in DDT resistant *Aedes aegypti*—*J R Busvine & W Z Coker*

Dieldrin resistance in *Culex pipiens fatigans* in Malaya—*R H Wharton*

Sensibilite aux insecticides chlores des larves de *Culex fatigans* et d *Anopheles aquasalis* en Guvane Française—*H Floch & P Fauran*

## Notes

Preferential knockdown action of cetyl bromoacetate for certain laboratory reared resistant strains of houseflies—*A R S Ascher*

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# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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## TENTH ANNIVERSARY COMMEMORATIVE SESSION OF THE WORLD HEALTH ASSEMBLY

To mark the celebration of the tenth anniversary of the World Health Organization the regular session of the World Health Assembly<sup>1</sup> was preceded this year by a special "Tenth Anniversary Commemorative Session". At the invitation of the Government of the United States of America both sessions as well as the twenty second session of the Executive Board<sup>2</sup> were held in Minneapolis Minnesota. The two-day commemorative session which was attended by delegates from most of the 88 member states of WHO was held in the Municipal Auditorium under the chairmanship of Dr Sahib Hassan Al Wahbi, President of the Tenth World Health Assembly and former Minister of Health of Iraq.

First to address the Assembly was the Honourable P. K. Peterson, Mayor of Minneapolis who extended to the delegates a hearty sincere and cordial greeting and a deep warm welcome. He was followed by the Honourable L. Freeman, Governor of the State of Minnesota who drew attention to the happy coincidence that WHO's tenth anniversary fell in the same year as the hundredth anniversary of Minnesota's statehood and said that the joint celebration gave the people of Minnesota an opportunity to see an illustration of the kind of progress they hoped for in their second century. He believed that the success of WHO in mobilizing international co-operation by eighty eight nations gave reason to hope that a way might be found to prevent not only death by disease but death by war.

The type of multilateral co-operation exemplified by WHO was described by the Honourable Francis O. Wilcox, Assistant Secretary of State for International Organization Affairs as the diplomacy of the future. He said that WHO had a "record of solid achievement and had built an

ever increasing storehouse of knowledge and experience which today is available to millions of people throughout the world for the improvement of their health and their well being". He thought that this progress had been possible because WHO had achieved "a remarkably happy blend of the highest idealism with the soundest of practical operating techniques". He went on:

It has not attempted to bite off more than it can chew. It has exercised praiseworthy realism in recognizing the limits within which it has to work and in concentrating its efforts and designing programmes geared to available resources. These programmes not only have had great impact in the present but also serve as clear evidence of what can be expected in the future.

For some people however the future is a grim prospect for they see the population of the world rapidly outstripping its resources—and they believe that WHO is accelerating this process by its efforts to reduce infant mortality rates and to increase man's longevity. Even now Mr Wilcox said it is estimated that 1 800 000 new births occur every week and if the present trend continues the world will soon be "literally bursting at the seams". Nevertheless he was not on the side of the pessimists for he was able to point out that in 1956 world food production was 3/4 higher than in the previous year while the world population had increased by only 1/7 in the same time. It was significant "that some of the substantial increases in production occurred in former malarial areas where the work of WHO has been particularly active and effective. This is the answer to those who believe that an improvement in health standards will exacerbate the world's health problem rather than contribute to its solution. As Mr Wilcox pointed out:

Quite apart from the moral aspect of this problem, it remains a fact that people who are racked with fever or weak from debilitating diseases cannot

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PRINTED IN SWITZERLAND

has a special character in that it is composed of persons technically qualified in the field of health. The experience of ten years has shown that "health workers of all countries can transcend their national points of view and apply their varied experience to the needs of the Organization in a purely international spirit."

Describing the methods used by WHO to meet requests from governments, Dr Al Wahbi referred to the unique character of the network of regional offices through which "there comes to the Organization a sympathetic and clearer understanding of the needs and desires of Member States" and through which also advice and assistance is sent out to the various countries. Among the principal functions of WHO, Dr Al Wahbi mentioned the collection and collation of medical knowledge by expert committees and other meetings of specialists, the stimulation of research, technical publica-

tions, the work on international standardization and the provision of teachers and the granting of fellowships to further the education and training of health workers. But he pointed out "the health of mankind cannot be served by medicine alone." Health, economic prosperity and social progress are all interdependent.

A poor country has not the resources to build an effective health organization or to undertake campaigns against disease. Health workers cannot be provided unless there is a good general education on which to graft the special training. An undernourished population cannot be healthy. WHO has therefore sought and found ways of co-operating with other organizations with the United Nations, with specialized agencies, with inter-governmental and non-governmental organizations, as well as with scientific institutions and individual workers in all parts of the world. We have learnt much of how this essential co-operation can be made practical and effective and we propose to learn more.

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### *Message from the President of the United States of America*

*The Tenth Anniversary Commemorative Session of the World Health Organization directs our attention to the fact that the nations of the world are working together in harmony for the improvement of the living conditions of all peoples. As a result of the work of the World Health Organization and the stimulating leadership it has given to its member states, millions the world over are spared from disease and sufferings that would have been their lot. The United States is proud of its part and the part of its health leaders in this mutual endeavour. We look forward to even greater accomplishments in the control of diseases, in the building of health services and in the opening of new avenues of medical knowledge through research. We look to the World Health Organization with confidence as a proven instrument through which the nations and the peoples of the world can combine their efforts in friendship toward the building of true peace.*

DWIGHT D. EISENHOWER

make substantial contributions to their nation's productivity. The World Health Organization is helping to give people in many lands strength and energy to build and produce and grow the things man needs to live a more abundant life.

Finally Mr Wilcox referred to another aspect of the work of WHO: the contribution it was making to the creation of those conditions in the world which will form the basis of a lasting peace. This theme was developed further in the message prepared by Mr Dag Hammarskjöld, Secretary General of the United Nations, and read by his personal representative, Mr Philippe de Seynes, Under Secretary for Economic and Social Affairs. Mr Hammarskjöld was to have addressed the Assembly himself, but at the last moment other duties had prevented him from being present. He pointed out that nearly all the twelve world institutions within the United Nations family of agencies have been established since the Second World War. The problems of economic, social and technical development for all nations have evolved in such a way since 1945 "as to make organized international co-operation across all barriers of politics, ideology and culture a sheer necessity if each of them is to reap the benefits of the new developments in science and technology without creating new tensions and risks."

But two factors have contributed to limit the funds available to such institutions and to encourage bilateral rather than multilateral agreements: the natural administrative caution of governments making them reluctant to allocate large funds to agencies still in the experimental stage of development and the political conflicts of the post-war years. During these years, however, a well-tried multilateral machinery has been built up which has also shown itself capable of adaptation to meet new needs as they arise, and the emphasis has been placed on the need for inter-agency co-operation and co-ordination for every one of our international organizations affects every other and requires its support to a greater or lesser extent. Mr Hammarskjöld believed that there was now a growing recognition of the political as well as the economic value of the

multilateral United Nations approach. He concluded:

The United Nations are pioneers in an experimental undertaking in the direction of a better international order. Although still in the early stages of development, they have, I believe, fully justified the faith of the Member governments which established them: that such world institutions are essential to the nations in their efforts to cope with the great challenges of our times.

On behalf of the Assembly, the President, Dr Al Wahbi, thanked the United States Government, the Governor of the State of Minnesota and the Mayor of the City of Minneapolis for their generous hospitality and recalled some of the contributions made by the United States to national and international medicine. He went on to present an outline of what WHO has done and what it has learned during its first ten years of existence. Although when the Organization began its work it was faced with a task "almost frightening in its large simplicity," it was able to profit from the example and experience of earlier health organizations such as the Pan American Sanitary Bureau, the Office International d'Hygiène Publique, the Health Organisation of the League of Nations and the Health Division of UNRRA. But Dr Al Wahbi said there was another advantage enjoyed by WHO of which we are not always sufficiently conscious:

Health work, by its nature, has one great simplification which is not found in some other international fields. The economic development of one country may, if it is pursued with too narrow a view, be gained at the economic expense of other countries; narrow political ambitions may disturb a country's neighbours; but no country can possibly suffer if the health of its neighbours is improved. There are no ideological differences about health.

One of WHO's main problems is to decide the order in which its manifold tasks should be undertaken. The selection is based on the general programme of work submitted by the Executive Board of the Health Assembly. Instead of a rigid list of priorities, this sets out guiding principles, elastic enough to take account of the needs and circumstances of individual countries. Dr Al Wahbi pointed out that the WHO Executive Board

the endowments of the human individual and of that summation of individuals the nation and of that totality of nations the world" was relatively new. The achievements of the past ten years were exciting but "the faith which was the forerunner and the moving spirit of those achievements is of even greater importance." For money and material were not in themselves sufficient to ensure "the fulfilment of the undertakings the aims and the ambitions and the responsibilities of the World Health Organization. It needs not only the devotion but the labours—labours in a multitude of vineyards—of human beings."

The addresses delivered to the Assembly by Dr Brock Chisholm, first Director General of WHO, and by Dr Marcelino Candau, its present Director General, were in a sense complementary. Dr Chisholm spoke of the important role of the Executive Board and the Secretariat, while Dr Candau paid a tribute to the contributions of the Member States.

Dr Chisholm described the Executive Board as unique in that it is made up of individuals whose responsibility is wholly to the World Health Assembly and not to their government in any degree whatsoever. He stressed that if the Board were made up of representatives of governments it would become a political body whose technical advice could never again be relied on by the World Health Assembly. The integrity of the Executive Board, he said, is basic to the integrity, the reputation and the fulfilment of the destiny of the World Health Organization. With reference to the Secretariat, Dr Chisholm pointed out that the formation of an international civil service from a group of national individuals was a slow growth process and that it may take some time to establish traditional attitudes toward service to the peoples of the world independently of the country of origin of any particular member of the Secretariat. For this reason a high degree of continuity is of the greatest possible importance.

Dr Candau said that it was most gratifying to all concerned that WHO is today nearer than ever to the goal of universal member-

ship. Even more important was the fact that nearly all the Member States now participate fully and actively in the basic functions of WHO. The steady increase in the regular budget—from five million to nearly fourteen million dollars over the last ten years—was "tangible proof of the confidence of governments in WHO." More precious even than financial participation, however, was the willingness of countries at whatever stage of their development to make available skilled and specialized manpower. More than a thousand of the world's leading health experts were members of the expert advisory panels, and during a one year period 1100 WHO fellows had been received by 577 institutions in 42 countries. Dr Candau also spoke of the "truly spectacular network of scientific centres" whose research work is co-ordinated by WHO and of the thousands of research workers all over the world to whose participation in "this great international co-operative programme" we owe the prospect of ultimately defeating polio, myelitis, influenza, rabies and other public health menaces.

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It is natural that the impact of the assistance provided to governments by WHO should have been greatest in the countries that were technically less well developed. Most of these countries lie in tropical or subtropical areas and were formerly ravaged by endemic and epidemic diseases; their delegates were often able to report that malaria and yaws had been eradicated or were in the process of eradication and that a large measure of control had been achieved over such diseases as cholera, plague and smallpox. There were many reports too of considerable progress in building up national public health services to the point where they will be able to stand on their own feet—the ultimate aim of the WHO programmes. The results achieved are a testimony not only to the value of international co-operation through WHO but also to the efforts made by the governments of these countries to make the best possible use of the assistance provided. Nevertheless



In addition to statements from the chief delegates of 41 member states the Assembly also heard addresses by Dr Brock Chisholm first Director General of WHO by Dr Milton S Eisenhower, personal representative of the President of the United States of America by Sir John Charles President of the Executive Board and by Dr Marcolino Candau the present Director General

A message from the President of the United States with which Dr Milton Eisenhower prefaced his address is reproduced on page 221 Dr Eisenhower who is President of the Johns Hopkins University said he was proud of the part his university had played in the development of the World Health Organization Not only had the School of Hygiene and Public Health collaborated directly with WHO in research on the treponematoses but many of the delegates to the World Health Assembly were former students of the University and the Director General himself was one of its graduates

Dr Eisenhower pointed out that for the past decade WHO had been concerned mainly with the conquest of diseases for which methods of control were already known But as the communicable diseases are gradually brought under control or eradicated the focus of attention will shift to other problems such as heart disease and cancer An early solution of these problems demands an intensification of research on an international scale

We need more rapid exchange of ideas and information between laboratories and scientists We need more opportunities for scientists to meet together and discuss freely their work and their problems We need to find the gaps in research and fill them We need to develop research workers and give them scope and opportunity We need to search world wide to know where diseases occur and why We must test in the laboratory empirical observations that are made in the field and in the hospitals We must examine those materials and ideas that have persisted through the centuries as traditions and superstitions in the folklore of the world

The World Health Organization fills the key role of stimulator and co ordinator of research The expert advisory panels now have a total membership of 1400 health

experts and close working relations have been established with 1800 institutions and laboratories But although the record is impressive said Dr Eisenhower, much more needs to be done He suggested for the consideration of the Assembly that during the coming year WHO should conduct a special study to determine how it may most effectively perform its fullest role in research and he indicated that the Department of Health Education and Welfare on behalf of the United States would be prepared to support such a preliminary study with a grant of \$300 000 The initial emphasis he thought should be on heart disease and cancer and he assured the Assembly that if a sound plan could be produced that would merit the approval of Member States the USA would be prepared to consider providing further substantial support It was hoped that as a result of the study international patterns of effort would be established which might lead as President Eisenhower had suggested last January to "a full scale co operative programme of science for peace"

After Dr Al Wahbi had thanked Dr Eisenhower and asked him to transmit to the President of the United States of America the gratitude of the Assembly for "this mark of his interest he called on Sir John Charles President of the Executive Board to address the delegates Sir John did not intend he said to deal with the milestones of progress or with the minutiae of the economies of the Organization He was more concerned with the blossoming of ideas with the flowering of co operation with the greater and growing united willingness to serve not national interests only but the good of mankind" He was at pains to show too that the concept of health as a state of complete physical mental and social well being and not merely the absence of disease or infirmity was not new it recalled and re echoed the voices that like a great bell have rung down the ages" Nearly 1800 years ago Galen had proclaimed

Health is a sort of Harmony and not merely that condition in which suffering no pain we are not impeded in the activities of life But the concept of health as one of

Like many of the delegates in the subsequent discussions he emphasized the necessity for more research. "We need" he maintained to intensify our study of the basic physiological and biochemical processes that underlie human health and disease. We need to know more about how and at what rate various organs of the body are and deteriorate. We have few answers to any of these problems and until we begin to get those answers our efforts to prevent and control the chronic diseases will remain limited. Or Burney went on to discuss some of the ways in which WHO can help to speed up research for instance by bringing together medical scientists in various types of meetings by acting as a world clearing house of public health knowledge and by effective co-ordination.

He referred also to the importance of intensifying training activities so that what we know is used in a constantly expanding sphere to prevent and to cure illness and he considered it "a paramount responsibility of the world health community to reduce the lag between the discovery of new knowledge and its application. Lastly Dr Burney drew attention to the need for wider public participation in health work. Because of the complexity of the newer health problems he said we must be prepared to go far outside the traditional health setting to make effective progress. In the case of chronic diseases restoration of the patient to functional independence may be complicated by social factors such as lack of family ties inadequate living arrangements or lack of a job suited to the patient's physical status. After treatment must come rehabilitation. Successful rehabilitation services not only bring great gains in human happiness but they also result in impressive economic gains. Individuals restored to active normal lives may become economic producers as well as consumers and moreover need no longer immobilize many well persons in providing permanent and constant care.

Dr Burney concluded his address with a call for leadership and added we must meet boldly and with action not only the challenging health problems of today but

those of tomorrow and of the generations to come. We can look at the past with great pride we look to the future with great anticipation. We can meet these challenges of the present and the future by working to ether—WHO all nations organizations and individuals. I have complete confidence that we shall not fail either ourselves or the people we serve."

## REPORT OF THE DIRECTOR-GENERAL

The Director General introducing his report on the work of WHO during 1957<sup>1</sup> said that as in the preceding years a considerable part of WHO's resources had been devoted to the attack on communicable diseases which remained one of the basic challenges of the Organization. The outstanding development had been the launching of the campaigns for the eradication of malaria. "The progress made" he continued is due largely to the growing co-operation of many countries. If this attitude is maintained and extended with regard to the other major preventable diseases we may expect during WHO's second decade to witness an almost complete transformation of the present epidemiological picture throughout the world."

One indication of the direction in which WHO's work was likely to develop in the future was to be found in the repeated references made in the report to the co-ordination of research. As examples the Director General mentioned the studies being carried out on the control of tuberculosis on the epidemiology of leprosy on sylvatic plague and on rabies and brucellosis. The work of the expert committees and study groups was of growing importance and enabled WHO to keep at the disposal of member governments up-to-date information concerning new advances of public health importance. Not the least of the Organization's responsibilities was to inform Member States of health dangers resulting from new discoveries and technical developments and

it was pointed out that in some instances WHO is handicapped by the fact that countries have not yet reached a level of development sufficient to enable them to benefit to the full from the discoveries of modern medical science

In contrast to these areas were those countries that already had well developed public health services and were relatively free from pestilential diseases. Although some of them had not had to call on WHO for any field assistance they had found the technical work of the central office of the greatest value. Particular mention was made of the production of the *International Pharmacopoeia* and the establishment of international standards of the work on narcotic drugs and food additives of the Epidemiological Intelligence Service and of

the publication of the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*. Of special interest also were the reports of the expert groups, published in the *Technical Report Series* and the *Monograph Series*.

Many delegates also stressed the fact that in view of the speed of modern communications no country can afford to be disinterested in the state of health of its neighbours. An epidemic commencing in one country can within a matter of days be a serious problem to every other country in the world. As the Honourable Francis Wilcox had earlier expressed it "In the field of health we have passed the point of no return. International co-operation is not only sensible and desirable it is absolutely essential."

## ELEVENTH WORLD HEALTH ASSEMBLY

The Eleventh World Health Assembly which was held in Minneapolis, Minnesota (USA) from 28 May to 13 June 1958 was attended by the delegates of 85 Member and Associate Member States. In view of the fact that the Organization is this year celebrating its tenth anniversary the regular session of the Assembly was preceded by a special commemorative session, an account of which is given on p. 219.

In opening the regular session Dr S. Al Wahbi, President of the Tenth World Health Assembly, extended a particular welcome to the delegates of Czechoslovakia, the Federation of Malaya and the recently formed United Arab Republic. Czechoslovakia had resumed active participation in the work of the Organization at the beginning of this year and the Federation of Malaya became a member of WHO on 24 April 1958.

The Assembly unanimously elected Dr Leroy E. Burney, Surgeon General of the US Public Health Service, as the new President. The three Vice Presidents elected were Dr J. Anouti (Lebanon), Dr A. Sauter

(Switzerland) and Dr Tran Vy (Viet Nam). The Chairman of the Committee on Programme and Budget was Professor N. N. Pesonen (Finland) and the Chairman of the Committee on Administration, Finance and Legal Matters was Mr S. Khanachet (Saudi Arabia). The Executive Board was represented by Sir John Charles and Dr P. E. Moore.

In his inaugural address Dr Leroy E. Burney said WHO's efforts during its first ten years had been concentrated largely on the fight against the major communicable diseases. Although steady progress was being made these diseases still sap the life and energy of millions. Our initial success, he continued, should not permit us to slacken our efforts nor to fail to plan wisely for the future. For every child that is today saved from dysentery we will have an adult who may eventually acquire a chronic illness. For every young worker who is today spared from premature death from malaria we will have an older person who may develop one of the diseases of later life.

The Regional Director for Africa stated that in the Region as a whole there were estimated to be at least two million persons affected with leprosy. Almost one million of them were receiving regular treatment already and it seemed likely that in the near future all leprosy cases in the Region would be under regular treatment.

In the Philippines the delegate of that country reported more than 4000 new cases of leprosy have been admitted to sanatoria during the past four and a half years and another 4000 have been discovered and treated in mobile and stationary skin clinics. About 3400 patients have become negative and nearly 2000 of these discharged. The attitude of the public towards leprosy was becoming more enlightened but in many places discharged patients were still not readily accepted back into the community and there was a need for further education.

## Yaws

In the African Region it is estimated that some twenty million people were affected by yaws; thirteen million of the population in endemic areas have already been examined and more than seven million treated. The Regional Director said it was believed that the disease could be eradicated in the Region in the near future. The post of regional adviser on yaws has been dropped since most of the yaws campaigns have reached the stage of consolidation and integration within the regular public health services. The Liberian delegate announced that the elimination of yaws was almost complete in his country and said the success of the campaign had been a great stimulus to public health programmes throughout the country. In Ghana a total of 1 300 000 people were examined for yaws in 1957. 114 000 cases had been diagnosed and treated and 480 000 people had been given prophylactic injections of penicillin. The delegate of Nigeria stated that in his country the campaign against yaws had succeeded brilliantly; the decrease in prevalence had been so great that its total disappearance was only a matter of a few years. He said it would be interesting

to see whether the disappearance of yaws would be followed by an increase in syphilis. Commenting on this point the delegate of Haiti remarked that in his country where the yaws eradication campaign had also proved very successful<sup>2</sup> the disappearance of yaws had been accompanied by a decrease in the incidence of syphilis both in urban and in rural areas.

## Smallpox

The Regional Director for the Americas was able to report that since 1954 no cases of smallpox had occurred in North America, Mexico, Central America or the Caribbean area and that there had been a considerable reduction in incidence in South America. The decision to attempt the eradication of smallpox in the Western Hemisphere was taken by the Pan American Sanitary Conference in 1950. The initial emphasis was on the development of a dried vaccine which would be stable in tropical temperatures and a number of laboratories for the production of dried vaccine had been installed. Assistance in the production of dried vaccine is also being provided in the Eastern Mediterranean Region; the Regional Office is supplying lyophilization apparatus and sending an expert with it to advise national health administrations on its use. Plans have also been made for eradication in this Region. Starting in October 1958 a regional survey team including an epidemiologist and a laboratory expert will visit all countries in the Region and advise governments and the Regional Office on eradication measures. The Iranian delegate reported that more than 4 500 000 people had been vaccinated in the course of the past year and that more than 4 000 000 doses of vaccine had been supplied to neighbouring countries. A highly successful campaign against smallpox has also been waged in Korea. As a result of compulsory mass vaccination the number of cases of smallpox has been reduced to less than ten a year out of a population of 23 000 000. A proposal put forward by the

to advise on the precautions to be taken against such hazards

One of the most pressing immediate needs continued to be the strengthening of national health services especially the development of training facilities. During 1957, over 100 international teaching personnel had been provided and over one thousand fellowships awarded. Several professors of preventive medicine from selected countries had been given the opportunity of receiving advanced training at a well known school of public health in the United States of America, an experiment that had yielded encouraging results.

The Assembly noted with satisfaction the manner in which the programme of the Organization had been carried out during 1957 and commended the Director General on the work accomplished. The discussions that took place on the Director General's report gave the delegates an opportunity to describe the progress made in their countries over the past year and to express their views on the types of project on which they would like greater emphasis to be placed in the future. For a comprehensive account of the discussions which ranged over a great many aspects of public health the reader is referred to the verbatim record of the plenary meetings and the minutes of the committees and sub-committees.<sup>2</sup> The following summary is intended only to give an idea of the type of discussion that took place and does not of course represent a complete picture of the work that is being done in these fields. Certain important questions which were debated at considerable length by the Assembly are dealt with in more detail.

### Tuberculosis

Several delegates reported that very satisfactory progress had been made in their countries in combatting tuberculosis. In the Netherlands for example the mortality rate has fallen to 4.6 per 100 000 and the morbidity is fast decreasing. The anti-tuberculosis campaign is now being directed

towards special groups of the population especially adolescents in schools and industry. The Irish delegate stated that in his country the death rate from tuberculosis in 1957 was 21 per 100 000, only one sixth of what it was in 1947. In Iran more than 700 000 people have been subjected to the tuberculin test and 400 000 of them vaccinated with BCG. The construction of four sanatoria has been completed and four outpatient tuberculosis clinics are about to be put into operation. In Pakistan seven million people have so far been vaccinated with BCG. The control schemes set up in Karachi have done excellent work in training medical nursing and technical staffs and activities have now been extended to East Pakistan. BCG vaccination is also making good headway in Honduras. The first tuberculosis dispensaries have been set up and two tuberculosis hospitals with specially trained personnel are already operating.

### Leprosy

The delegate of Ghana gave an account of the development of the leprosy service in his country since a full time leprologist was first appointed in 1947. Previously lepers had been looked after in three main leper settlements by district medical officers on a part time basis. The first supplies of sulfone drugs became available towards the end of 1948 but it was not until the introduction of diamino diphenylsulphone (DDS) that a real expansion of the service could be undertaken. The greatest development however was the introduction and extension of outpatient treatment facilities. Special auxiliaries of the leprosy service toured the country holding clinics in the small villages. Two years ago with the help of WHO and UNICEF a land rover service was introduced making it possible to carry treatment into remote areas. The attendance at such travelling clinics is 80.95% compared with a maximum of about 70% at static clinics. It is estimated that there are some 50 000 persons suffering from leprosy in Ghana and so far 32 000 have been treated. During 1957 2519 patients were issued with discharge certificates.

financing community water schemes through long term low interest loans. With a view to translating these ideas into action the Assembly requested the Director General to make a comprehensive review of the work of WHO in assisting Member States in the field of environmental sanitation with particular reference to the provision or improvement of potable water supplies and the adequate disposal of human wastes. This review is to be submitted to the Twelfth World Health Assembly together with suggestions for further activities including ways and means of financing the work.

Other aspects of environmental sanitation discussed were hygiene and sanitation in aircraft and the reduction of air pollution. The delegate of the United Kingdom of Great Britain and Northern Ireland reported the introduction of legislation to prohibit the emission of dark smoke from chimneys to regulate the emission of grit and dust from furnaces and to prevent smoking nuisances. Advisory bodies known as Clean Air Councils have been set up in England and Wales and in Scotland. Particular attention is being paid to education of the younger generation and it is hoped that with the co-operation of industry and the public a major advance will be made in solving the problem of air pollution in the United Kingdom and that this will contribute to a reduction in the heavy load of respiratory diseases.

#### Training of health personnel

The provision of adequate training facilities for physicians, nurses and auxiliary health personnel continues to be one of the basic problems facing public health administrations particularly in the less well developed countries. Many of the delegates spoke on this question and it was clear from their accounts that great efforts are being made to improve the situation. The Philippines delegate for example stated that the first step towards an integrated health service had been to establish a national office to facilitate and co-ordinate training. Five area training centres had then been created and each would eventually expand to become a comprehensive medical centre combining hospital

care and nursing education with training in public health and in the many disciplines involved in the various aspects of preventive and curative medicine. In 1954 the Institute of Hygiene of the University of the Philippines which had been training physicians in public health since 1927 had expanded its curriculum to include at graduate level public health engineering, public health nursing and health education. The Department of Health was planning to strengthen basic education and the deans of four leading medical schools had been sent abroad to study developments in modern medicine. During the past four years nearly four thousand health personnel had received in service training in the five area training centres or the central office in addition short term training (2 to 3 weeks) had been given to 1810 affiliates from nursing schools and 978 affiliates from midwifery schools during the past three years.

The delegate of Spain believed that the most important task of medical schools and universities today was to inculcate into the students the principles of preventive medicine. In Spain a specially trained body of physicians had been formed for service chiefly in rural centres where they functioned as obstetricians and child care specialists. In Mexico the delegate of that country reported the Ministry of Public Health has already taken steps to sponsor departments of preventive medicine in the various university medical schools and it is planned that in five or six years time the universities themselves shall take over the functioning of these departments. He wondered whether WHO's present efforts could not be supplemented by seeking some means of financing for the time being departments of preventive medicine in medical schools where government action to that end had not yet been possible.

The delegate of India said that there was general concern to secure the use of modern methods of teaching in medical schools in order to provide a balanced programme of study relating preventive medicine to the basic subjects otherwise a decade or more might elapse before the new concept of integrated curative and preventive medicine

USSR delegate that WHO should institute a plan aimed at the world wide eradication of smallpox is discussed on p 231

### **Onchocerciasis**

The French delegation described a programme for the control of onchocerciasis in French West Africa where this disease remains a serious problem. Detailed maps will first be prepared showing all water points where the speed of the current is sufficient for the breeding of the simulum larvae. Teams of trained personnel will then be sent out to treat all the breeding places with larvicides. Patients will of course continue to receive medical attention. It was stated that such a programme could achieve not only control but eradication provided that neighbouring countries in which the disease is prevalent also instituted similar campaigns. A course dealing with the clinical pathological and therapeutic aspects of onchocerciasis is being arranged this year by the Regional Office for Africa.

### **Environmental sanitation**

The question of environmental sanitation received great emphasis during the discussions both in the plenary meetings and in the meetings of the Committee on Programme and Budget. Several delegates pointed out that infantile diarrhoea and other gastro intestinal diseases due to infected water supplies constitute a major public health problem in their countries and some concern was expressed that WHO did not appear to be devoting sufficient attention to this problem. The Australian delegate said he had been alarmed to find that plans were being made for psychiatric programmes and similar activities in countries where the water was undrinkable. The Indian delegate pointed out that in the South East Asia Region environmental sanitation projects were under way in Afghanistan, Burma, India and Ceylon. WHO's function was to act as a catalyst and stimulate governments to action. Nevertheless he thought that more might be done in the way of pilot projects

and he hoped that in future environmental sanitation and water supply would receive greater emphasis. The delegate of Indonesia suggested that WHO should make a study as soon as possible on how best it could help governments to overcome their problems of environmental sanitation in rural areas. In reply to some of the points raised it was stated on behalf of the Director General that one of the basic deficiencies in country programmes of environmental sanitation had been the lack of properly trained personnel at the supervisory and auxiliary levels. WHO had therefore devoted its efforts particularly to the training of advisers and staff. The Organization was fully aware of the importance of environmental sanitation and was giving all assistance within its power. About half a million dollars had been set aside for expenditure on environmental sanitation in 1959. As a number of speakers had pointed out the reason for the relatively slow development in the field of environmental sanitation was the large capital outlay required from the countries themselves. At the present moment WHO is preparing a guide on the operation of water treatment plants and has just published a monograph on standards of drinking water quality.

The USA delegate pointed out that although from the time of the First World Health Assembly the importance of environmental sanitation for the attainment of the Organization's objectives had been repeatedly stressed more than half the total population of the world still lacked safe water. He suggested that in the next five to ten years Member States with the leadership of WHO should focus their efforts on bringing safe water to the homes of their peoples in quantities enough to provide for simple cleanliness and comfort. It was just as practicable he maintained to bring water supplies to smaller communities as to the large urban populations. He went on to say that time after time the high capital cost of water supply schemes was invoked as a reason for lack of progress or action but such a pessimistic outlook was completely unwarranted. He thought that WHO should undertake a study on ways and means of

projects suggested for the immediate future represented a substantial contribution to the quantitative aspects of public health planning and administration. For decades past public health administrators had been hampered by lack of reliable data on health services but recent progress in scientific sampling methods and health survey techniques might enable this obstacle to be overcome. Many new avenues were opening up for the use of statistical methods in public health, and WHO now had the opportunity to play a progressive role in determining and exploiting appropriate methods of all types. Several other delegates spoke along similar lines and there was general acceptance of the view that WHO should now take more active steps to encourage the acquisition of up-to-date statistical data on health and disease from all feasible sources. The Assembly requested the Director General to continue his study in this field with the object of submitting a final report to an early session of the Executive Board and to include in this report recommendations on a forward looking and balanced programme for the development and strengthening of systematic procedures for securing adequate vital and health statistics.

### Eradication of smallpox

The delegation of the USSR submitted to the Assembly a proposal that WHO should embark on a programme aimed at the total eradication of smallpox. Introducing this proposal the delegate pointed out that the total number of cases of smallpox throughout the world had fallen only very slightly during the past decade. A considerable number of cases were imported every year into countries which had been declared free of the disease so that the problem was an international as well as a national one. On the other hand the technique of vaccination was simple and inexpensive and immunity lasted for several years. Since man was the only reservoir of the virus it should therefore be possible to achieve eradication of the disease in a relatively short time. This could be done without simultaneous vaccination of the entire popu-

lation of the world. It would be sufficient to vaccinate periodically in endemic areas. Eradication could then be completed by additional vaccination and effective quarantine. The implementation of such a programme however would require a very determined effort on the part of governments and WHO.

The delegations of many other countries warmly supported the proposal made by the USSR. Several of them indicated that smallpox had already been eradicated or nearly eradicated in their countries but there are many areas where it is still a major public health problem. Some doubts were expressed regarding the practicability of achieving world wide eradication in so short a time as four to five years. The delegate of South Africa pointed out that although vaccination had been carried out in that country for a very long time it was only recently that smallpox had been eradicated. The delegate of Australia also believed that eradication would not prove as easy as it might appear since it would require that all countries where the disease is endemic would have to be both willing and able to carry out vaccination systematically year after year and co-operate to the fullest extent in international measures.

Some of the difficulties encountered in tropical countries were outlined by the delegate of France. Dried vaccine although possessing advantages over liquid vaccine deteriorates rapidly under tropical conditions. Moreover many of those vaccinated either wiped off the vaccine or exposed it to the sun. There was also the difficulty caused by the constant movement of large sections of the population in certain parts of Africa at the annual vaccination the same people might appear time after time while others never appeared at all. The delegate of Switzerland said that during the past 30 years two cases of smallpox had been imported into that country both of which recovered but during the same period there had been 30 deaths from post-vaccinal encephalitis. It was therefore becoming more and more difficult to impose compulsory vaccination and to maintain the immunization of the population



could be put into practice. He suggested that a better way of achieving this objective than by the award of fellowships spread over several fields would be for WHO to provide visiting professors, specialists in preventive medicine for certain medical schools which could then be up graded and used to serve a wider area. The Indonesian delegate stressed the need for training greater numbers of better qualified paramedical personnel and suggested that WHO should make a study of the best type of education and training for paramedical personnel in an integrated health service. It was stated on behalf of the Director General that the provision of teachers for pre medical and pre clinical training was recognized to be of great importance to the less developed countries and it was pointed out that WHO was already providing many teacher training staff in basic subjects. Visiting teams of medical scientists often included a specialist in one or more basic subjects and the experience of such teams would improve future plans. The suggestion made by the delegate of India was extremely interesting and would be given careful study.

### Public health services

The discussions on public health services centred mainly around two questions: health education of the public and maternal and child welfare. The question of health education has been receiving considerable attention in the Federal Republic of Germany where the second international conference on health education was held in 1957. A further international seminar on this subject will be held in Germany in 1958 and WHO is providing two lecturers as well as a number of fellowships. The work of some hundred voluntary organizations is being co-ordinated by the German Federal Committee on the Health Education of the Public. This committee also collaborated with the International Union for the Health Education of the Public in preparing material for the technical discussions on health education which are scheduled to take place at the Twelfth World Health Assembly.

Several delegates emphasized the importance of maternal and child health and the necessity for integrating this work into the general health services of the country. The delegate of New Zealand stated that in some countries WHO projects were planned in such a way that they would fit into the health services of the countries concerned but unfortunately this was not true of all countries. Unless integration was planned from the beginning it would prove difficult to achieve when the projects were completed. On behalf of the Director General it was explained that the primary objective of WHO was to assist governments to set up adequate national health services. Where a particular type of service did not already exist projects had had to start as separate ventures but the ultimate aim had always been to integrate them into the national service.

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### BUDGET FOR 1959

The Director General, introducing his budget estimates for 1959, stated that he proposed an effective working budget of \$14 287 600 which represented an increase of some \$721 000 or 5.3% over the effective working budget for 1958. In the subsequent discussions all the delegations expressed their approval of the proposals and at the suggestion of the delegate of India the budget was adopted by acclamation. It was decided that the budget level for 1959 should be established in an amount equal to the effective working budget plus the assessments on inactive Members and on China.

### PROGRAMME FOR 1959

#### Health and vital statistics

In accordance with a request made by the Tenth World Health Assembly the Director General had submitted to the Executive Board a progress report dealing especially with the past and present work of WHO in vital and health statistics. The United States delegate was of the opinion that the additional

In reply to these points it was stated that measures to prevent the reinfestation of cleared areas were being considered by the Expert Committee on Malaria and by the Committee on International Quarantine for the treatment of suspected cases of malaria. WHO had been mainly recommending a single dose of chloroquine or pyrimethamine but not a mixture of the kind referred to by the Belgian delegate. It was suggested by the delegate of Costa Rica that a team of investigators should be sent into areas that had been cleared to certify that eradication was complete. The Mexican delegate said that a system of dual evaluation had been found very valuable in his country: one evaluation team worked as part of the campaign making periodic assessments of progress and a second team, without personal interest in the campaign, made an independent assessment.

The Assembly expressed satisfaction at the progress of the world-wide malaria eradication campaign and urged all governments concerned which had not yet started programmes of eradication to do so as soon as technically feasible. It thanked those donors whose contributions had enabled the eradication programme to get under way and requested the Executive Board and the Director General energetically to pursue concentrated efforts to obtain funds for the Malaria Eradication Special Account from all possible sources.

#### Atomic energy and health

A question that was very much to the fore in the discussions of the Assembly was the responsibility of WHO in regard to the health hazards arising from the peaceful uses of atomic energy and from ionizing radiations in general. In this connexion the Assembly heard with interest a statement by a representative of the International Atomic Energy Agency (IAEA) which has been set up "to seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world." He said the first task of the Agency was to give assistance to members in the training of

specialists in the various fields of atomic energy and two hundred fellowships are being provided for this purpose. Secondly the Agency intends to work out measures for the protection of health and safety and methods for the disposal of radioactive waste as well as to draft regulations for the transport of radioactive materials. It was also proposed to set up one or more groups of experts including specialists in medicine to visit countries on request and give advice on the application of radioisotopes. The Agency might also assist in the purchase of radioisotopes, the creation of national laboratories and in obtaining the necessary equipment. The IAEA representative stressed the need for close co-operation with WHO and other organizations working in the same field and said co-ordination was essential if duplication of effort was to be avoided.

The delegate of Norway stated that his Government was very anxious that WHO should conclude an agreement with the International Atomic Energy Agency as soon as possible. The Director General replied that he had already been authorized by the Executive Board to negotiate such an agreement but he referred to a number of practical difficulties in delimiting the responsibilities of the two organizations.

The delegate of Spain thought that WHO had two main functions in regard to atomic energy: the training of technical and medical staff and public health measures to ensure protection against radiation. Two reports bearing on these questions and published recently in the United Kingdom of Great Britain and Northern Ireland were referred to by delegates from that country. The first was prepared by a special committee appointed by the Prime Minister and dealt with the organization for control of health and safety in the United Kingdom Atomic Energy Authority. It was pointed out that there was an acute shortage of personnel possessing the necessary qualifications for the wide variety of duties they were called upon to perform in such an organization. It would be necessary to build up a new type of industrial medical service whose officers should have a course of up to six

at a satisfactory level. For this reason the Swiss delegation wished to give its whole hearted support to any effort to eradicate smallpox in countries where it was still endemic.

The Assembly unanimously decided to request the Director General to study the financial administrative and technical implications of a programme having as its objective the eradication of smallpox, the study to include the measures to be taken to avoid complications which might result from smallpox vaccination. The Director General was asked to submit a report on his findings to the Executive Board at its twenty third session. The Assembly also recommended to all governments that during 1959-1960 the population should be vaccinated in countries in which the principal endemic foci exist and that during 1961-1962 additional vaccination should be carried out in foci where the disease persists. Subsequently re-vaccinations should be given to the extent to which the experience acquired in each country shows it to be necessary. It was further recommended that during the period required for eradication smallpox vaccination should be continued in countries in which it is at present compulsory. Finally the Assembly called on medical scientists and scientific institutions active in the field of microbiology and epidemiology to increase their efforts to develop a smallpox vaccine resistant to the influence of temperature. The Director General was asked to report to the Twelfth World Health Assembly on the progress made and the results obtained.

The delegate of the USSR announced that his Government was prepared to release 25 million doses of smallpox vaccine for the campaign and the Cuban delegation made a formal offer to supply two million doses annually.

### Malaria eradication

In opening the discussion on malaria eradication it was explained on behalf of the Director General that the programme planned for the period 1958-1962 provided for assistance to 64 countries or territories

and for 6 inter country programmes covering all areas where the eradication of malaria is technically and economically feasible. Studies are also being made of methods that might enable the programme to be extended to other areas and provision has been made for field research on problems closely connected with eradication such as nomadism, elusive vectors and the use of Pinotti's method (administration of chloroquinized or pyrimethaminized salt). The programme covered nearly 70% of the 1105 million persons living in malarious areas. If all went well it was estimated that by the end of 1962 it should be possible either to declare eradication achieved or at least to cease large scale spraying operations in Europe, the Americas, Egypt, Tunisia, Libya, the southern part of Africa and a large part of Asia.

The entire programme it was explained had been based on the assumption that the Malaria Eradication Special Account would be used to supplement and not to replace funds earmarked for the purpose in the WHO regular budget or under the Expanded Programme of Technical Assistance. Account had also been taken of the part played by UNICEF and the very considerable aid received by Member States under bilateral agreements. The funds at present in the Special Account would be sufficient for the 1958 programme and as far as could be foreseen at present it seemed likely that a further amount of just over \$32 million dollars would be received. This would leave about \$15 million dollars still to be found.

The Director General announced the receipt from the Government of the USSR of a formal offer of 1000 tons of DDT for the Malaria Eradication Special Account. In addition to the \$5 000 000 already given by the USA, contributions of \$47 600 from the Federal Republic of Germany, \$5000 from Israel and \$9180 from Turkey were promised.

The delegate of Belgium stressed the importance of guarding against the reinfestation of areas that had been cleared of malaria. He also asked about recent experiments on the use of a 4-aminoquinoline in association with an 8-aminoquinoline for prophylaxis.

and for establishing, on a scientific basis hygienic standards for radiation exposure

### Sports medicine

The proposal that sports medicine should be included in the programme of WHO had been submitted by Denmark Finland Norway and Sweden to the twenty first session of the Executive Board which had requested the Director General to prepare a preliminary report on this question for the consideration of the Eleventh World Health Assembly In response to this request the Director General had collected information from various sources and had presented a report dealing with the effects of sports on health medical supervision of sportsmen and sports medicine as a medical specialty The report also contained suggestions on practical problems which deserved further study The discussion of the report was coloured by the differences in the importance attached to sports and to sports medicine in the various countries There were also some divergences of opinion as to the scope of sports medicine The delegate of the Netherlands said that although he recognized the importance of sports medicine he felt that there were at present too many more important problems facing the Organization and this opinion was shared by a number of other delegations Nevertheless there was general support for the suggestion that there were certain questions deserving further research The Assembly therefore requested the Director General to continue in collaboration with the International Federation of Sports Medicine his study on the nature of a programme on sports medicine paying special regard to physical exercise and training as a constituent of a constructive health programme

### OTHER BUSINESS OF THE ASSEMBLY

#### First Report on the World Health Situation

The Ninth World Health Assembly had requested the Director General to prepare for the Eleventh World Health Assembly

a First Report on the World Health Situation summarizing the reports submitted by Member States On behalf of the Director General it was stated that practically all Member States had provided specific information so that the report contained 157 reviews of countries or territories covering approximately 76% of the world population It represented a new approach to world health attempting to give a picture of health throughout the world as reported by the nations themselves in relation to their social and economic development The first seven chapters were devoted to a rather detailed consideration of various factors influencing public health the ways in which the health services developed and the trends of future development in health services A large part of the report was taken up by the reviews of individual countries Many delegates expressed their satisfaction with the report At the same time attention was frequently drawn to inaccuracies in the reviews of individual countries and in the course of a lengthy discussion the opinion was widely held that ample time should be allowed for revision of these sections of the report before it is published The Assembly therefore requested Member governments to submit before the 1 October 1958 all amendments they wish to include in the report It also invited them to supply material for a second report covering the period 1957 to 1960 to be submitted by the Director General to the Fifteenth World Health Assembly

#### Study to plan an intensified research programme

The Assembly also discussed the United States proposal already announced at the Tenth Anniversary Commemorative Session that WHO should undertake a study for developing a programme of extended activity in medical and scientific research For this study the United States had declared its willingness to make a special grant of \$300 000 There was general appreciation of the United States initiative but some delegates appeared a little uncertain regarding its precise implications In answer to questions

to nine months in radiation physics as well as training in radiobiological work. A total of eighteen months full time study would be required and this might justify a new professional qualification. In addition there was an urgent need for a full understanding of radiological hazards amongst medical officers of health and their senior medical staff industrial nurses and health visitors should also be given basic instruction.

A second report had been published by the Medical Research Council. This indicated that one of the main health hazards arose from the extensive use of ionizing radiations in diagnostic radiology and that fall out from explosions was of much less significance. This was in line with a statement made by the New Zealand delegate who outlined some of the precautions taken in his country to protect users of X rays and radioactive substances. All users of radioactive substances were licensed and all persons working with ionizing radiations wore films which were analyzed regularly. According to regulations drawn up by the Radiological Advisory Council no person should be exposed to more than the maximum permissible dosage and the licence holder is held responsible for any ill effects if the protective regulations are not observed. A widespread educational programme was carried out among all users of diagnostic X rays. By such means as added filtration the use of higher voltages and faster films it had been possible to reduce the dosage received by patients in some cases to about one twentieth of the original dose. Over the past seven years a gradual reduction had been achieved in the amount of radiation received by workers in this field and the amount was now remarkably low.

The delegate of the USSR outlined a proposal that WHO should take the initiative in organizing systematic research into the accumulation of radioactive substances in the air the water the soil and in foodstuffs of vegetable and animal origin. He referred to the various sources of ionizing radiation to which man is exposed and in particular to the problem of the disposal of radioactive waste. The question of somatic effects and

more particularly of the genetic effects of small doses of ionizing radiation merited special attention he said. WHO had taken the first serious step by convening a group of outstanding scientists to study the effects of radiation on human heredity<sup>4</sup> and the work so successfully begun should be continued internationally and on a broader scale. The proposals of the Soviet Union were sponsored by the governments of 22 other Member States and after clarification of certain points were adopted unanimously by the Assembly. It was decided that early attention should be given to the following questions:

(a) methods for the reporting of radiation exposure of individuals

(b) research design for determining the relationship between radiation dosage and congenital defects

(c) methods for the notification to public health administrations of congenital defects which could be due to radiation

The Director General was requested to prepare a programme of concrete measures in the field of health aspects of the peaceful uses of atomic energy with the object *inter alia* of making an early report on these questions. In the light of the concern of governments about duplication and overlapping he was also asked to expedite negotiations with IAEA with a view to submitting to the Twelfth World Health Assembly a draft agreement on co-operation between the two organizations in fields of mutual interest. The Assembly further invited the Director General to initiate consultations for the purpose of organizing in the very near future assistance to under-developed countries in the matter of the use of radioactive isotopes in medicine to study the effect of radiation on human heredity and to recommend measures to be taken for studying the relationship between radiation in health for research on the treatment of diseases attributable to radiation.

<sup>4</sup> Eff. J. R. d. t. H. man H. di. R. p. t. f. a. S. d.  
G. P. M. b. f. h. G. p. G. 1957 sec. 140 Ch. b.  
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the Public Health Service was significantly strengthened by means of increased financial grants to research institutions and by the creation of the National Cancer Institution and the National Institute of Mental Health. A Communicable Disease Center was established at Federal level to co-operate with the states in the study and prevention of communicable diseases. To meet the domestic health problems resulting from the Second World War this service under Dr Parran's direction undertook emergency activities including the wartime health and sanitation programme of assistance to state and local health authorities in especially affected areas. Anticipating the action of the World Health Organization on a global level by many years, Dr Parran transmuted malaria-control activities in the USA into eradication, and out of this initiative grew the Communicable Disease Center already referred to which is at present carrying out important health work on a broad front. During the latter part of his administration as Surgeon General the Clinical Center at the National Institutes of Health was planned and its construction was begun. These developments, together with others too numerous to mention, brought the Public Health Service of the United States Government to increasingly close relations with the health departments of the 48 states of the Union as well as those of United States territories abroad and in particular gained for it a place of leadership in the world scene.

Under Dr Parran's present direction the Graduate School of Public Health of the University of Pittsburgh has developed into an outstanding educational and research centre in the field of public health. Its influence is felt throughout the Country and by the training provided to students from abroad widely throughout the world. Dr Parran has also played a prominent part in the establishment of the World Health Organization. He was a member of the Technical Preparatory Committee which utilized his draft proposal as a basis for the Constitution of WHO. He was Chairman of the United States delegation to the International Health Conference in 1946 and was elected its President. He served as United States member of the Interim Commission of WHO and in 1948 was Chairman of the United States delegation to the First World Health Assembly. Before this, Dr Parran had travelled extensively to examine and advise on UNICEF activities his recommendations contributed greatly to the effectiveness of the joint programmes of UNICEF and WHO particularly the field of maternal and child health. Even today Dr Parran's interest in the work of WHO and the international health effort has not diminished. As President, and subsequently as Treasurer of the National Citizens Committee in the USA for WHO and as a member of its Board of Directors, he has con-

tinued to give his active support through unofficial channels to international co-operation in health.

Through these achievements and many others Dr Parran has earned an outstanding reputation throughout the world in the field of social medicine.

In accepting the award which he felt to be a signal honour Dr Parran referred to the debt he owed to his earliest contact with the Health Section of the League of Nations—a lifelong inspiration which he had found the opportunity to express many years later in the address he gave at the signing of the WHO Constitution when describing what he felt should be the goals of international co-operation in the field of health. Dr Parran continued:

These goals set for the World Health Organization represented the highest aspirations of the human spirit. Few of us believed that they could be reached fully and in a short time-span but we should never lose sight of them. It is a source of great satisfaction that we have moved Ten Steps Forward—in fact we probably might say ten times ten—since this Organization was started. That such substantial progress has been made is all the more remarkable when we consider the continued unsettled conditions in world affairs during these past twelve years. For what has been accomplished great credit is due to the leadership given by Dr Chisholm and by Dr Candau. Credit also goes to the staff in Geneva and the regional offices and especially in the field as well as to the delegates to these several Health Assemblies and the work of the Executive Board.

From the outset education and training have played an important role—the 8000 WHO fellowships attest to this—and the more recent concern of the United Nations and WHO with atomic energy in relation to health recognizes the importance of this new factor in man's environment.

Viewing the sciences in historic perspective one can detect periodicity. There have been periods of fusion and of the reverse—a disintegration of effort. In the earliest period the natural philosophers were the universal scientists exploring all of life in order to gain a greater understanding of its meaning. (And in the future as in the past I am sure that philosophers will contribute to our understanding of life of natural laws and of the universe.) In due course it became possible to study one or another aspect of life and living creatures. This led to specialization which burgeoned in medical research and medical teaching until the specialist came to be known as the person who knows more and more about less and less. There are signs now that this trend is being reversed.

raised the United States delegate explained that the proposal was for a study only in the first place and there was no suggestion that WHO should embark on a large grant programme. Nor was the proposal limited to any disease or group of diseases: it called for a study of research needs and resources to determine where international assistance was most urgently required.

The Assembly requested the Director General to organize and arrange for a special study of the role of WHO in research and of ways in which the Organization might assist more adequately in stimulating and co-ordinating research and developing research personnel. A plan prepared on the basis of this study is to be submitted to the twenty-third session of the Executive Board and to the Twelfth World Health Assembly.

#### **Elections to the Executive Board**

The following six States were elected as Members entitled to designate a person to serve on the Executive Board: Brazil, France, Guatemala, Iran, Union of Soviet Socialist Republics, Viet Nam.

As a result of the establishment of the United Arab Republic, one seat on the

Executive Board had become vacant. The Assembly agreed that the United Arab Republic should assume the term of two years remaining to Egypt and elected Tunisia to replace Syria for the remaining one year of its term of office.

#### **Voting on the Budget**

After a lengthy debate the Assembly decided to amend the rules of procedure so that in future the adoption of the effective working budget would be included among the important questions to be decided by a two-thirds majority.

#### **Anard of the Léon Bernard Foundation Prize**

The Assembly awarded the Leon Bernard Foundation Medal and Prize for 1958 to Dr Thomas Parran, USA. A description of the ceremony will be found below.

#### **Place of the Twelfth World Health Assembly**

The Twelfth World Assembly will be held next year in Geneva, Switzerland.

## **LÉON BERNARD FOUNDATION AWARD**

The Eleventh World Health Assembly awarded the Leon Bernard Foundation Medal and Prize of 1958 to Dr Thomas Parran, Dean of the Graduate School of Public Health of the University of Pittsburgh, USA, in recognition of his outstanding contribution and practical achievements in social medicine. Dr Parran is the eighth recipient of this honour since it was established in 1934 by the Health Committee of the League of Nations and the third American to be thus distinguished.

The President of the Assembly, Dr Leroy E. Burney, in presenting the Prize, recalled the main steps of Dr Parran's career.

Born in Maryland in 1892, Dr Parran graduated with honours in 1915 from the College of Medicine

of Georgetown University at the same time receiving the degree of Master of Arts from St John's College, Annapolis. After just 20 years of distinguished service in 14 states of the Union in public health research and administrative assignments, including a period as Commissioner of Health for the State of New York, he was appointed Surgeon General of the US Public Health Service on three successive occasions, holding this post from 1936 until 1948. During this period under Dr Parran's leadership the Service took on a number of highly important new functions which contributed greatly to the advancement of public health in the USA. Among them were the development and expansion of national control programmes against venereal diseases, tuberculosis and cancer; provision of grants in aid to the states of the Union for these and other public health purposes; and a large scale programme of grants for hospital construction. The research programme of

by an impassable gulf. But in our preoccupation with newer and complex problems public health workers must continue their emphasis upon traditional bases for action. We need also to apply to the solution of these newer problems the principles that we have learned from the past.

As one looks back man has been concerned over the centuries with getting enough food to meet his metabolic needs and with controlling his microbiological environment. Neither object as yet is met for most of the world's people and the continued growth of population—estimated at about 1.6 per year—may continue to outrun increased food production. Consequently public health must be concerned with problems of natality as well as of mortality.

The economy of scarcity has been superseded by one of abundance in this and other Western nations. Hence we are concerned here with metabolic disorders—obesity, alcoholism, effects of smoking, all of which are disorders of excess rather than deficiency. Even the concept of stress as a cause of mental illness contains excess—the impact of more challenges than the organism is able to bear. Sir Geoffrey Vickers has recently said: "Our hazards from excess range from the excessive clear radiation through excessive smoking to the excessive consumption of ice cream—products which have in common the fact that our superabundance is of our own desiring."

Each new breakthrough of a discovery in the health sciences and each shift in living patterns will produce additional tasks for WHO and for the national health services. Certainly we are faced that additional responsibilities have already been produced by urbanization, by industrialization, by the major threats arising from air pollution, and even from the density of a tomorrow on the highways. Yet none of these serious problems as yet has been solved.

Add to the familiar environmental hazards is a new factor—namely nuclear fission and its use for the production of power. The known supply of fossil fuels is inadequate to meet the power needs.

The future and in the absence of practical methods for harnessing solar energy or unravelling the secrets of photosynthesis nuclear power is being developed on a huge scale. This will increase at an ever accelerating pace with many nations getting into the act but having too little comprehension of the dangers involved. The disposal of radioactive garbage poses a whole series of riddles not yet solved even by the nation's most technically advanced. Such problems will continue to increase. We must develop the organ upon the personnel and—most important of all—acquire the knowledge with which to cope with these problems.

Research biology now offers many new fields for

research and for the training of individuals to deal with them. Our own Graduate School of Public Health at Pittsburgh is pioneering in such a programme of research and training of new types of specialists who will combine the knowledge of the traditional health sciences with the newer knowledge of nuclear technology. This expanded area of health training we think will be invaluable in maintaining the health of man as we enter nuclear competition.

While never losing sight of its long range goals, WHO in every country must start any programme on the basis of what now exists in any country or region. Each step forward must be practical in the light of the limitations imposed by current traditions, customs and resources.

It is gratifying to note the trend in many countries to seek WHO's help in working out long term plans for the coordinated development of their own health services and the growing willingness of countries to engage in joint action with their neighbours in solving common problems.

In the Director-General's Report for 1955 the importance of strengthening the national health services was stressed. At that time he said that there was a tendency for the nations increasingly to seek help mainly in three directions: (1) supplies to be used in the world wide struggle against communicable disease; (2) the strengthening of services already established; and (3) the raising of standards of education and training of all types of workers.

Even more attention needs to be given by WHO and every Member State to the collection of more accurate and more comparable health statistics. Without them the course of public health cannot be charted wisely.

I have referred to the world wide population explosion and the need for health agencies at all levels to be concerned about it, to seek better to understand these complex phenomena and, within their religious and cultural contexts, to devise programmes of research, education and action to deal more successfully with them.

There are two great drains upon the resources the manpower and the accumulation of capital in most countries which detract from human health and well-being. One is this population increase which requires increased expenditure for food, clothing, housing and other items of what normal living requires for the too-rapidly increasing population; the other is expenditure to provide for war or the prevention of war—defence. What a different world we could have if some of these expenditures could be directed to the better cultivation and development of our human capital, the human resources in each country. Health education, recreation, nutrition, arduous needs. Should not most of these possible savings be directed to programmes in each country



—that a scientist needs to have more than one skill under one skull—and that through a fused spectrum of scientific knowledge future progress lies. This trend apparent in medical and public health education and practice as well is to see man and his environment as a whole and especially to interpret the dynamic interrelations in these man environment interactions in short human ecology.

During recent years the earlier distinction between public health and medicine has started to become blurred also is that between physical and biological science so that at present there is no boundary within the biological sciences across which the physical sciences may not usefully pass. In this process of infiltration there is a resulting integration of all biological sciences into a continuous and more meaningful whole. The viruses are a case in point. They are inert chemicals under certain circumstances under other circumstances they are reproducing organisms with emergently known genetic behaviour and disease agents of grave importance. Who has jurisdiction here? Is it the physical scientist the biologist or the physician? Clearly we need to submerge the old distinctions and preserve the interrelatedness and wholeness of nature.

There has been a long transition from the ritual of the primitive medicine man to today's medicine of the sciences. The expansion of medical knowledge and teaching in recent years has been dominated by the scientific discipline of medicine itself and by segments of knowledge drawn from other sciences as well so that today biological and natural sciences have become the very matrix of medical thought. Physics, chemistry and biology indeed are its language and tools.

The past century has been called the era of the biological and the physical scientist but today we may be entering the century of the psychological man or more properly of the psychological sociological anthropological man. Perhaps the next century will view the first half of this one as the period in which society moved away from its preoccupation with man solely as an economic creature.

Public health has been termed "an applied technology resting upon the joint pillars of natural science and social science." During the past century the natural science pillar has been greatly strengthened but until both the pillars are strong the arch of public health will not be firm. Consideration is being given to the social aspect of the environment therefore especially as it interacts with the biological and physical stresses. But since stress effects are both psychological and physiological emphasis must be given to a fuller understanding of the psychological factors in stress and disease reactions.

My colleague Dr Robert E Olson has drawn attention to the problems facing public health saying

The biochemist who studies the kinetics of a purified enzyme system has only a few variables to control the physiologist who studies the metabolism of an intact organ in an animal has many more to consider the physician who studies a disease process in an intact human animal has even more parameters to correlate and attempt to control in the diagnosis and treatment of his patient. But the public health scientist who is studying the behaviour of populations is dealing with an infinitely complex situation to which in many instances only statistical solutions are possible.

Let us recall that in the past certain factors known to affect public health adversely could be engineered out of the physical environment. Today there is need of a revealing analysis of the social environment which blocks the way to abundant public health. Most of the degenerative diseases which constitute our major health problems have psychosocial components. The so-called psychosomatic diseases such as hypertension peptic ulcer rheumatoid arthritis and schizophrenia have direct psychiatric determinants others such as obesity alcoholism and coronary artery disease have at least indirect relations with socio-cultural patterns of diet anxiety reduction or stress.

Public health needs to be increasingly concerned both in research and teaching with a comprehensive ecological approach to problems of disease and of health if we are to be successful in understanding better the degenerative diseases—and mental illnesses particularly. The clinician must expand his horizon to include the role of the family and the community in relation to the disease problem at hand.

By the same token the public health scientist must not be content solely with statistical solutions and epidemiological inferences in his analysis of these knotty problems. The meeting ground lies in the interdisciplinary teamwork of a group from many fields of science in sympathetic agreement with each other and with access to the experimental laboratory the patient the family and the community as needs be in pursuit of the problem under study.

We may by the epidemiological method when it is paralleled by biochemical studies identify disease prone individuals in a population before they become sick. Once this is achieved it may be possible to control certain internal factors as well as external environments and thus retard the progression of a disease almost certainly there are such psychosocial and nutritional factors. Such knowledge may be to the prevention of the degenerative diseases what immunization and good sanitary engineering have been to the prevention of communicable diseases.

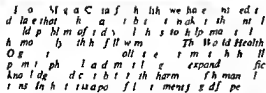
It is agreed that the behavioural and the biological or biochemical aspects of man are not separated

CHAIRMAN OF THE TECHNICAL PREPARATORY COMMITTEE  
AND PRESIDENTS OF THE INTERNATIONAL HEALTH CONFERENCE AND  
THE FIRST TEN WORLD HEALTH ASSEMBLIES



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Professo Re e S d Belgium Ch m n of the Tch  
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U. S. Department of Health, Education and Welfare  
Public Health Service  
Washington, D. C. 20492



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to improve their own standards of health and well being some funds being made available to WHO and other international agencies? Specifically I would propose that all Member States of WHO in addition to their regular contributions take 2/ just two cents out of every dollar each year from their annual appropriations for military purposes and use it as an extra contribution to the Expanded Programme of Technical Assistance of the United Nations in which WHO should have a substantial share

With such funds and the sentiment behind them, malaria eradication would be speeded up smallpox tuberculosis syphilis and yaws would be next on the list to go In fact all the ancient plagues could be conquered within a measurable number of decades and then WHO could turn its energies more fully to improving nutrition to promoting physical and mental vigour to expanding scientific health knowledge and finally to the most difficult task of all—the improved harmony of human relations

## Dr LEROY E BURNEY

*President of the Eleventh World Health Assembly*

Dr Leroy E Burney was born in Burney Indiana in 1906 and studied medicine at Butler University Indianapolis and at the University of Indiana where he obtained his doctorate in 1930 Two years later he earned a Master of Science degree in public health from the Johns Hopkins University School of Hygiene and Public Health He then entered the United States Public Health Service and during the years 1937-39 he established the first mobile venereal disease clinic service in Brunswick Georgia In 1943 he was appointed Assistant Chief of the Division of States Relations Washington and from 1945 to 1954 he served as Health Commissioner and Secretary of the Indiana State Board of Public Health For the next two years he held the post of Assistant Surgeon General and Deputy Chief of the Bureau of States Service In 1956 he was promoted to Surgeon General of the Public Health Service of the United States Department of Health Education and Welfare the appointment he holds at present

the Americas Dr Burney has for some time been closely connected with the work of the



As a member of the Directing Council of the Pan American Sanitary Bureau which acts as the WHO Regional Committee for

Organization He was the chief delegate of the United States to the World Health Assemblies of 1957 and 1958

# CHAIRMAN OF THE TECHNICAL PREPARATORY COMMITTEE AND PRESIDENTS OF THE INTERNATIONAL HEALTH CONFERENCE AND THE FIRST TEN WORLD HEALTH ASSEMBLIES



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Professor Re S d Belg m Ch ma of th Tch  
cal P ep rat ry Comm t t P 1946

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f th l e t a l H l h C f N w Y o k 1946



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P f A d t Stamp Y g t l P e d e t o f th



*We have developed beyond the primitive stage where sharp distinction was made between physical and mental health. We now know that without mental health there exists no physical health and vice versa. Therefore to my mind it is a special encouragement that WHO in its programmes specifically includes mental health as a separate and important item.*

Dr Karl Evang Norway President of the Second World Health Assembly 1949



*More than half the people of the world live in areas where modern health services with reasonable standards of efficiency are non-existent and the work of the World Health Organization will make its impress on the world health problem only by promoting through all possible means the provision of adequate health protection to these peoples.*

Rajkumari Amrit Kaur India President of the Third World Health Assembly 1950



*Much evidence is available that retarded economic development is largely due to the prevalence of preventable diseases in many parts of the world. The direct road to betterment of living conditions is therefore through action in the health field.*

Dr Leonard Scheele United States of America President

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*The enthusiastic welcome which the world has accorded the principles set forth in the Constitution of the World Health Organization is evidence of the universality of its aims and of the urgent need that was felt for an organization that would undertake the advance of medical knowledge and the improvement of health throughout the world. Such an effort leads to better understanding among peoples and above all affirms the principle that public health knows no frontiers.*

Dr. Morones Prieto, Mexico, President of the Eighth World Health Assembly, 1955



*If health is to be made accessible to man both at the national and at the personal level, governments and peoples must unite their efforts. Moreover, if health is to be protected, merely defensive measures are no longer enough; an offensive on a world-wide scale must be launched not only against the diseases of the body but also against those of the mind and against those sources of conflict bred by social inequalities.*

Professor J. Parisot, France, President of the Ninth World Health Assembly, 1956, Chairman of the eighth and ninth sessions of the Executive Board



*The World Health Organization has learnt year by year how to profit from its hard-won experience and how continually to adapt its policies and programmes to meet the evolving needs of its Member countries. After nine years of work, our Organization may justly claim that it is now equipped to carry out with maximum efficiency any tasks, however arduous and however delicate that it may be called upon to perform."*

Abdi Izzat, Iraq, President of the Tenth World Health Assembly, 1957, Chairman of the sixteenth and seventeenth sessions of the Executive Board



# CHAIRMEN OF THE EXECUTIVE BOARD



D. A. T. Shaha  
1948-1949



S. R. Arcoot  
1949-1950



D. H. S. G.  
1950-1951



D. M. J. F.  
1952-1953



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Dr Morones Prieto Mexico President of the Eighth World Health Assembly 1955



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Abd al Karim Iraq President of the Tenth World Health Assembly 1957 Chairman of the sixteenth and seventeenth sessions of the Executive Board





S. J. Chai  
twenty first son 1957 1958

# DIRECTORS GENERAL OF WHO



D. B. Chai  
1946-1948  
General



D. M. G. Chai  
1953  
General



Dr Melville Mackenzie twelfth and  
thirteenth sessions 1953 1954



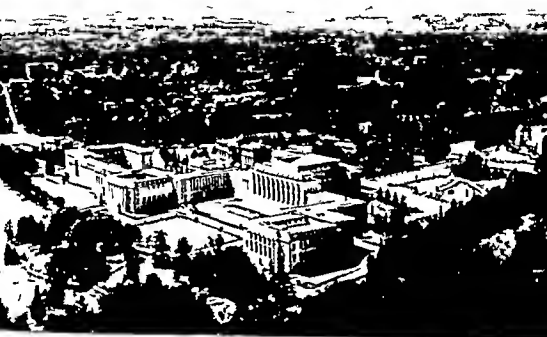
Dr H van Zile Hyde fourteenth  
and fifteenth sessions 1954 1955

Dr S Al Wahbi Chairman of the Board at its sixteenth and seventeenth sessions was later President  
of the World Health Assembly and his photograph appears earlier in this number



Professor G A Canaperla eighteenth  
and nineteenth sessions 1956 1957

# HEADQUARTERS OF THE WORLD HEALTH ORGANIZATION



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# THE LEON BERNARD MEDAL AND PRIZE



The medal and prize of the Léon Bernard Foundation established in memory of Professor Leon Bernard one of the founders of the Health Organisation of the League of Nations are awarded periodically for outstanding service in social medicine. The first award was made in 1939 to Dr Wilbur Sawyer. Since 1950 the award has been made by the World Health Assembly.

## RECIPIENTS OF THE MEDAL AND PRIZE SINCE 1950



Professor Charles Edward Amory Winslow (1952)



Dr Johannes Frandsen (1953)



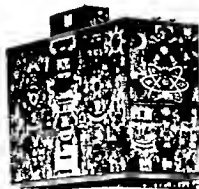
Professor Marcin Kacprzak (1957)

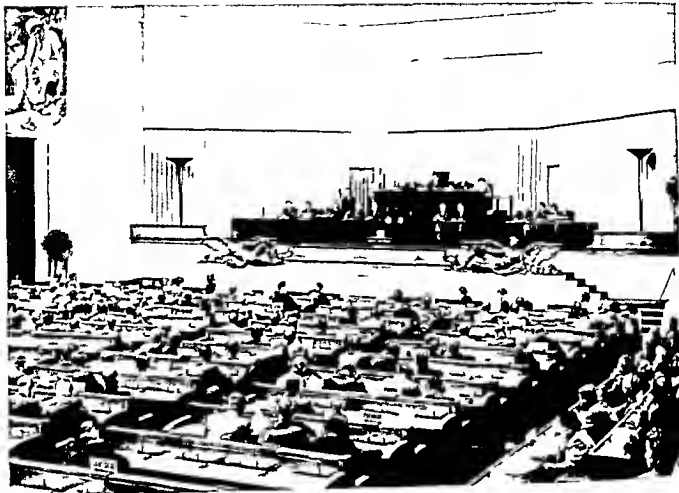
Other recipients whose photographs appear earlier in this number have been Professor René Sand (1951), Professor Jacques Parisot (1954) and Professor Andrija Stampar (1955).

# ND EXECUTIVE BOARD

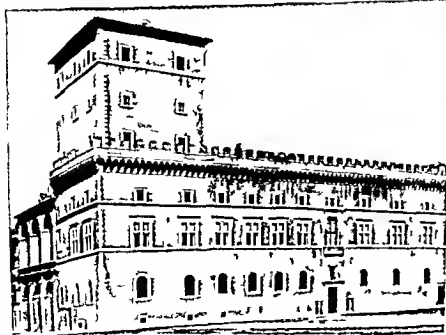
A meeting of the Executive Board of the Chicago Public Schools

The Library Building of the University City of the District of Columbia, Eighth and H Streets, Assembly Room, held the Executive Board meeting May 1955





The World Health Assembly in plenary session in the Assembly Hall Palais des Nations



The Palazzo Venezia Rome where the Second World Health Assembly was held in June July 1949

## TWENTY SECOND SESSION OF THE EXECUTIVE BOARD

Immediately after the closure of the Eleventh World Health Assembly<sup>1</sup> the Executive Board held its twenty second session on 16 and 17 June 1958 in Minneapolis USA. At the opening meeting the Board unanimously elected as Chairman Dr P. E. Moore, Director of Indian and Northern Health Services, Department of National Health and Welfare, Ottawa (Canada) and as Vice Chairmen Dr A. Habernoll, Ministerial Counsellor, Federal Ministry of the Interior, Bonn (Federal Republic of Germany) and Dr C. Diaz, Collier, Director of Experimental Studies in Public Health, Ministry of Health and Welfare, Mexico City (Mexico). Dr M. Slim, Medical Inspector, Tunis (Tunisia) and Dr T. R. Tewari, Deputy Director, General Health Services, New Delhi (India) were elected as Rapporteurs. The Director General of WHO, Dr M. G. Candau, acted as Secretary.

The other members of the Board for the present term of office are the following: Dr E. J. Y. Aujaleu (France), Professor G. A. Canaperia (Italy), Sir John Charles, retiring Chairman (United Kingdom), Dr A. R. Hakima (Afghanistan), Dr H. van Zile Hyde (United States), Dr Le Van Hhai (Viet Nam), Dr A. J. Metcalfe (Australia), Mr H. Olivero (Guatemala), Dr H. M. Penido (Brazil), Dr A. H. Radji (India), Dr M. D. Shohb (United Arab Republic), Dr J. N. Togba (Liberia) and Professor V. M. Zhdanov (USSR). The alternates to Sir John Charles are Dr Aujaleu, Dr Radji and Dr Shohb; to Dr A. E. W. Rae, Dr L. Bernard; to Dr Dia, Dr El Chatti; and to Dr A. Diba, respectively.

### Main subjects of discussion

Apart from specific topics of an administrative, financial and organizational nature the following were the most important

subjects considered: smallpox eradication campaign, creation of a consultative committee to advise on negotiations with the International Atomic Energy Agency programme of technical discussions for coming Assemblies and approval of expert committee reports.

### *Smallpox campaign*

The Executive Board approved the establishment of a special account to receive gifts of smallpox vaccine and other gifts offered by governments to assist in the smallpox eradication campaign which will be undertaken in accordance with the decisions of the Eleventh World Health Assembly. The first contributions to this account were made by the Governments of the USSR and Cuba which offered respectively 25 million doses of vaccine and an annual contribution of 2 million doses.

### *Atomic energy*

The Board also decided to establish a consultative committee to advise the Director General in his negotiations with the International Atomic Energy Agency for the purpose of concluding an agreement between WHO and this new specialized agency of the United Nations. The committee will consist of the following members: Dr E. J. Y. Aujaleu, Sir John Charles, Dr H. van Zile Hyde, Dr H. Penido and Dr T. R. Tewari with Dr P. E. Moore and Dr A. H. Radji as alternates.

### *Technical discussions*

In accordance with the decision taken at the eighteenth session of the Executive Board the subject selected for the technical discussions which will take place on the occasion of the Twelfth World Health Assembly to open on 12 May 1959 at WHO Headquarters in Geneva is "Health Education of the Public". The General Chairman of the technical discussions will be Dr Arcot

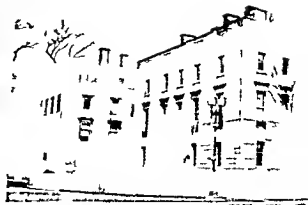
<sup>1</sup> See p. ...4



# THE REGIONAL OFFICES



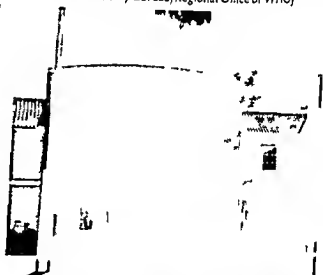
African Region Brazzaville



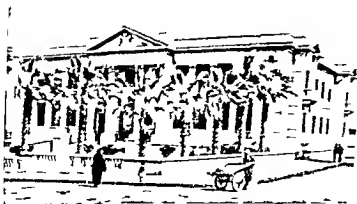
Region of the Americas Washington D.C. (Pan American Sanitary Bureau/Regional Office of WHO)



South East Asia Region New Delhi



European Region Copenhagen



Eastern Mediterranean Region Alexandria



Western Pacific Region Manila

## MALARIA ERADICATION

By the end of 1957 76 countries and territories were either carrying out or planning programmes of malaria eradication. During the year there was an increase in the amount of technical advice in this field provided by the Organization whose technical services were strengthened by the establishment of a new Division of Malaria Eradication. The Organization sponsored several technical meetings on antimalaria activities in the various regions as well as a number of training courses for antimalaria personnel.

The work of WHO in sponsoring and co-ordinating research on problems relating to malaria eradication was greater than ever before. A WHO advisory and research team continued to study *Anopheles gambiae* resistance to insecticides in various parts of Africa and the more general use of WHO standardized tests of mosquito susceptibility to insecticides led to the detection of new foci of resistance in a number of countries. WHO sponsored laboratory research on the

induction of resistance in anophelines by exposure of successive generations to insecticides continued as did research on the rapid sorption of insecticides from the surface of mud walls.<sup>2</sup> A new subject of research sponsored by the Organization in 1957 is the action that some antimalarials appear to have on the development of the mosquito-stages of the malaria parasites preventing them from reaching the final infective stage.

Towards the end of the year the Malaria Eradication Special Account was substantially increased by a generous donation from the United States of America with the result that some programmes can now be initiated without delay. More contributions will however be necessary in the next few years if WHO is to carry out the responsibilities in regard to malaria eradication entrusted to it by the Eighth World Health Assembly.<sup>3</sup>

See Chron. Wild Hlth Org. 1957 11, 371

See Chron. Wild Hlth Org. 1958 12, 169

## COMMUNICABLE DISEASES

During 1957 the co-ordination of laboratory and field research was extended to a wider range of epidemiological problems. Epidemiological studies and local surveys are now recognized as an essential preliminary to projects against practically every communicable disease. These surveys ensure realistic planning of control work and in some cases have led to simpler and more effective methods of control.

### Veneral diseases and treponematoses

WHO continued to assist yaws campaigns in Laos, Liberia, Nigeria, Sierra Leone, Thailand and the Caribbean area. In Haiti the mass campaign was completed and a surveillance system put into operation. In Indonesia yaws control work was incorporated into the public health services. Periodic

resurveys showed that in areas where mass campaigns were in operation the prevalence of yaws was greatly reduced and the transmission of the disease had been largely stopped. The campaign against endemic syphilis in Bechuanaland continued and assistance was given to venereal disease control campaigns in Ethiopia, Haiti, Iran, Morocco, Spain and Taiwan.

Success in the control of the endemic treponematoses in the rural areas of many countries now makes it practicable to turn to the control of venereal syphilis in the cities. WHO has suggested that a start might be made in Africa and in 1957 it recommended to governments of the African Region that they collect prevalence data as a preliminary step.

Grave allergic reactions after the administration of penicillin have been reported

Lakshmanswami Mudaliar (India) The subject chosen for the technical discussions at the Thirteenth World Health Assembly in 1960 is The role of immunization in communicable disease control while it was suggested that the topic of the discussions at the Fourteenth World Health Assembly should be Mental health programmes in public health planning

### *Reports by WHO expert committees*

The Board authorized the publication of the following reports First Report of the Expert Committee on Medical Rehabilitation Second Report of the Expert Committee on Training of Health Personnel in Health Education of the Public Fifth Report of the

Expert Committee on Environmental Sanitation Air Pollution Eighth Report of the Expert Committee on Insecticides Fourth Report of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel Post graduate Training in the Public Health Aspects of Nuclear Energy, Fifth Report of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel The Introduction of Radiation Medicine into the Undergraduate Medical Curriculum

The next session of the Executive Board will be held in Geneva starting on 20 January 1959 and will be preceded by a meeting of the Standing Committee on Administration and Finance which will commence its work on 13 January

## THE WORK OF WHO 1957

### *A Review of the Annual Report of the Director General*

The latest Annual Report of the Director General on the work of the World Health Organization<sup>1</sup> shows that in 1957 as in previous years the co ordination and stimulation of research played a leading part in the Organization's programmes for the control of the communicable diseases A feature of these programmes was the close link between laboratory research and field activities

An increasing effort was made to achieve the goal of world wide malaria eradication set by the Eighth World Health Assembly in 1955 in this field research into anopheles resistance to insecticides received particular attention Both the research and the epidemiological intelligence aspects of WHO's influenza programme were put to a severe test during the 1957 influenza pandemic In general the programme seems to have been adequate for its purposes

The shortage of trained personnel continued to retard further improvement in health throughout the world and special emphasis was laid by WHO on training programmes particularly in the fields of environmental sanitation and maternal and child health

During the year Ghana became a full Member of WHO while Albania Bulgaria Poland Romania and the USSR resumed active participation in the Organization's work<sup>2</sup> This resumption made it possible to implement the larger of two alternative programmes approved by the Ninth World Health Assembly for 1957 and also led to a natural expansion of activities in Europe

The following pages contain a brief survey of the principal activities mentioned in the Report

<sup>1</sup>W. l d J l l t h O g a n i z a t i o n (1958) *The work of WHO 1957* a u n i t e d p u b l i c a t i o n G e n e v a 1 9 5 8 6 9 p a g e s P r i c e 6 9 S w i s s F 4 P b l i s h e d  
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The work of WHO in sponsoring and co-ordinating research on problems relating to malaria eradication was greater than ever before. A WHO advisory and research team continued to study *Anopheles gambiae* resistance to insecticides in various parts of Africa and the more general use of WHO standardized tests of mosquito susceptibility to insecticides led to the detection of new foci of resistance in a number of countries. WHO-sponsored laboratory research on the

induction of resistance in anophelines by exposure of successive generations to insecticides continued as did research on the rapid sorption of insecticides from the surface of mud walls.<sup>2</sup> A new subject of research sponsored by the Organization in 1957 is the action that some antimalarials appear to have on the development of the mosquito stages of the malaria parasites preventing them from reaching the final infective stage.

Towards the end of the year the Malaria Eradication Special Account was substantially increased by a generous donation from the United States of America with the result that some programmes can now be initiated without delay. More contributions will however be necessary in the next few years if WHO is to carry out the responsibilities in regard to malaria eradication entrusted to it by the Eighth World Health Assembly.<sup>4</sup>

See Ch on *Wld Hlth Org* 1957 11 371  
See Ch on *Wld Hlth Org* 19 8 12 169

## COMMUNICABLE DISEASES

During 1957 the co-ordination of laboratory and field research was extended to a wider range of epidemiological problems. Epidemiological studies and local surveys are now recognized as an essential preliminary to projects against practically every communicable disease. These surveys ensure realistic planning of control work and in some cases have led to simpler and more effective methods of control.

### Venereal diseases and treponematoses

WHO continued to assist yaws campaigns in Laos, Liberia, Nigeria, Sierra Leone, Thailand and the Caribbean area. In Haiti the mass campaign was completed and a surveillance system put into operation. In Indonesia yaws control work was incorporated into the public health services. Periodic

resurveys showed that in areas where mass campaigns were in operation the prevalence of yaws was greatly reduced and the transmission of the disease had been largely stopped. The campaign against endemic syphilis in Bechuanaland continued and assistance was given to venereal-disease control campaigns in Ethiopia, Haiti, Iran, Morocco, Spain and Taiwan.

Success in the control of the endemic treponematoses in the rural areas of many countries now makes it practicable to turn to the control of venereal syphilis in the cities. WHO has suggested that a start might be made in Africa and in 1957 it recommended to governments of the African Region that they collect prevalence data as a preliminary step.

Grave allergic reactions after the administration of penicillin have been reported

in low but increasing prevalence in certain countries and this development is being closely watched. During 1957 WHO published two monographs on treponematoses<sup>5</sup>

## Tuberculosis

Two tuberculosis survey teams staffed by WHO and equipped by UNICEF worked in five African countries and territories during the year and several other regions are planning to start similar surveys. Data collected during such surveys are proving helpful in the evaluation of various epidemiological and diagnostic problems and in 1957 combined field and laboratory research was conducted on such questions as non specific allergy to tuberculin and the relative values of direct microscopy and culture methods in epidemiology. Other tuberculosis research sponsored by WHO included a study to develop laboratory methods that will give reliable indices of the potency of BCG vaccines and tests to determine the keeping qualities of a freeze dried glutamate vaccine produced in Japan<sup>6</sup>

A study group convened by WHO in September agreed that chemotherapy and chemoprophylaxis are important for the community control of tuberculosis but that field research is needed to establish more clearly the part that each can play<sup>7</sup>. An extended use of chemotherapy in field projects was recommended by the UNICEF/WHO Joint Committee on Health Policy in May 1957. Tests are being made in several pilot projects to determine the drugs or combinations of drugs most suitable for community treatment.

## Zoonoses and veterinary public health

The Joint FAO/WHO Expert Committee on Brucellosis met in October to review the progress made since 1952 in brucellosis

research co ordinated by the two organizations<sup>8</sup> and a WHO/FAO brucellosis centre was established in Tokyo. WHO continued to co ordinate research on rabies and grants were made to laboratories in various countries for work on antirabies serum and vaccines.

The preparation of reference antisera for eighteen major types of *Leptospira* was completed in several of the WHO/FAO leptospirosis reference laboratories. For a study of the part played by domestic animals in the epidemiology of human influenza specimens were collected from swine and horses in 25 countries before and after the human epidemic and sent to WHO influenza centres for examination. Studies were also started to assess the significance of the apparently specific antibodies to human poliomyelitis viruses that have been found in cattle and swine and of numerous viral agents analogous to the "orphan" viruses in human beings that are being isolated from domestic animals. Studies of diagnostic procedures for toxoplasmosis were continued.

Collaboration with FAO on milk and meat hygiene continued and a monograph on meat hygiene was published<sup>9</sup>. A WHO seminar on veterinary public health for countries of the European Region was held in Warsaw in November<sup>10</sup>.

## Virus diseases and vaccine studies

In just under three weeks after WHO received the first news of the 1957 influenza pandemic it was able to inform health authorities and vaccine producing laboratories that the responsible virus was unrelated to all previously isolated strains and that existing vaccines were unlikely to give protection. This warning enabled several countries to produce appreciable quantities of vaccine before the epidemic reached them<sup>11</sup>.

The WHO Expert Committee on Poliomyelitis met in July to review the results of

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poliomyelitis vaccination in various countries. Current technical procedures for production and testing were studied and problems needing further investigation were indicated.<sup>12</sup>

The first steps were taken towards a programme of co-ordinated research on arthropod borne virus diseases particularly the group-B encephalitis viruses. Details of a method for preparing a highly stable dried smallpox vaccine were distributed during the year and assistance was given to a number of countries wishing to start production. Final stages of the controlled trials of this vaccine were completed by the end of the year. Batches of stable dried typhoid vaccines were prepared for use in further field trials and for subsequent consideration as reference standards.

### Other communicable diseases

Ghana and the Federation of Rhodesia and Nyasaland started pilot projects for the control of bilharziasis. WHO sponsored studies

on the ecology of the snail intermediate host of bilharziasis continued and field workers in Africa co-operated in providing collections of snail species which have been sent to the three WHO snail identification centres.

Pilot trials of simple and cheap mass treatment schedules for the control of communicable eye diseases were continued in Taiwan and started in India, Indonesia and Spain. Co-ordinated research on the virology of trachoma continued.

Further antileprosy projects were undertaken, most of them in co-operation with UNICEF and progress was made in co-ordinating research on the pathology and epidemiology of leprosy and on the possible value of BCG vaccination in its prevention. Two training courses in the techniques of oochocerciasis control were started in Africa and research was co-ordinated on lesions of the posterior segment of the eye due to this disease. WHO assistance to India for a programme of field research on sylvatic plague came to an end during the year while assistance to a similar project in Indonesia was continued.

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## PUBLIC HEALTH SERVICES

### Public health administration

1957 saw a further development in the planning and organization of decentralized integrated health services in various parts of the world e.g. Afghanistan, Iraq and several countries in the Americas. Good progress was made with the United Nations and specialized agencies in co-ordinating international assistance for programmes of social development and WHO took part in a survey organized by the United Nations on community development in Africa.

### Nursing

Assistance continued to basic schools of nursing and midwifery and to the establishment of programmes of post basic nursing

education. A bibliography of text and reference books for basic and post basic programmes was revised and widely distributed and a supplementary bibliography on auxiliary nursing prepared. Other nursing publications prepared by WHO in 1957 were a monograph on nursing administration and a guide for the planning of basic nursing education programmes.

### Social and occupational health

The Joint ILO WHO Committee on Occupational Health met in March 1957; its report<sup>13</sup> deals with the training of physicians in occupational health and the organization of occupational health institutes. With help

*Wld Hlth Org. echo. Rep. Ser. 1957 835*

from WHO a department of occupational health was established during the year at the High Institute of Public Health Alexandria Egypt. A regional seminar on the nurse in industry was held in London by WHO which also co-operated in the organization of seminars on rehabilitation held in Indonesia and in Paris.

In the field of social health WHO continued its study of the cost and financing of medical services which was initiated in 1956 with ILO assistance.

### Health education of the public

Health education meetings sponsored by WHO in 1957 included the first African seminar on health education held at Dakar French West Africa<sup>14</sup> and the second European Conference on Health Education which took place at Wiesbaden Germany<sup>15</sup>. The WHO Expert Committee on the Training of Health Personnel in Health Education met in Geneva at the end of October. An eight week training course in health education was held at Noumea New Caledonia by WHO and the South Pacific Commission.

During 1957 the Organization in co-operation with UNESCO completed a study guide on the training of teachers for health education.

### Maternal and child health

Field activities during the year included assistance to the Government of Pakistan for the establishment of a new children's hospital in Karachi. Visiting professors of paediatrics provided by WHO were assigned to the medical schools at the Universities of Kabul and Madras. Short term consultants were sent to a number of countries to advise on various aspects of maternal and child health. A regional seminar on maternal and child health was held in Cairo in November 1957.

Plans were made for a study of how far the current definition of prematurity is

appropriate in different countries and work was continued especially in the Region of the Americas on anaemia in pregnancy and on diarrhoeal diseases of children.

### Mental health

WHO study groups on the following mental health problems met during the year: schizophrenia, the mental health aspects of atomic energy and the use of anxiolytic and hallucinogenic drugs in psychiatry. Studies were started on the epidemiology of mental disorder, the mental health effects of technical change and occupational therapy and rehabilitation techniques in the care of mental patients.

### Nutrition

Work on the prevention of protein malnutrition continued and considerable advances were made in the joint FAO/WHO/UNICEF programme on protein rich foods. The Joint FAO/WHO Expert Committee on Nutrition met in Rome in October and its report—which shows how the scope of the nutrition work of the two organizations has widened—will shortly be published. A training course for medical and other personnel concerned with nutritional problems in various territories in Africa was held in Uganda.

### Dental health

A WHO Expert Committee on Water Fluoridation was convened in August 1957. Its report<sup>16</sup> expresses the view that the effectiveness, safety and practicability of water fluoridation as a means of preventing dental caries are now established. A study of periodontal disease was made in co-operation with the Indian Council of Research and the US Public Health Service and WHO participated in a seminar on the subject held in Bombay.

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WHO continued to assist the United Nations Relief and Works Agency (UNRWA) in the health care of the 950 000 Palestine Arab refugees in Lebanon Syria Jordan and Gaza. Special attention was paid during the

year to the prevention and cure of gastroenteritis in infants. The maternal and child health programme was continued and a nutrition survey was made. Tuberculosis accounted for over 10% of the budget for health care and there was an increased use of chemotherapy in this connexion.

## ENVIRONMENTAL SANITATION

In view of the shortage of supervisory and administrative staff for national sanitation programmes WHO increased its assistance to educational institutions for courses in sanitary engineering.

In November the effects of air pollution on human health were discussed by a WHO expert committee which met in Geneva and by a WHO regional conference at Milan Italy.<sup>17</sup> A study of food sanitation problems was undertaken in co-operation with some countries of the European and Eastern Mediterranean Regions its purpose is to determine standards procedures and programmes that may be employed by health agencies in practical food control. Work has also begun on a programme for co-ordinated

research on standards of drinking water quality and on methods of water examination.

The directors of eleven laboratories attended a technical conference on insecticide resistance convened by WHO in July<sup>18</sup> and the WHO Expert Committee on Insect Resistance and Vector Control met in November. Seven new research projects concerning resistance were started with grants from WHO funds. A monograph on insecticide resistance in arthropods was prepared for publication<sup>19</sup> and an English translation of studies by Japanese scientists on insecticide resistance was published with help from WHO.

<sup>17</sup> See Chron. Wld Hlth Org. 1958 12, 115.  
<sup>18</sup> See Wkly A. W. A. (19 8) Insecticide resistance in arthropods.  
<sup>19</sup> Ge. eva (World Hlth O. units on Insecticide Resistance, N. 58).

<sup>17</sup> See Chron. Wld Hlth Org. 19 8 12, 14.

## EDUCATION AND TRAINING

During 1957 emphasis was laid by WHO on the training of public health workers to meet the new problems facing them as a result of the increasing use of atomic energy (see below). WHO study groups met in Geneva and Manila to consider aspects of the teaching of preventive medicine.

Fellowships for studies abroad in preparation for specific posts in the home country

again formed an important part of WHO's educational work. From 1 December 1956 to 30 November 1957 1086 fellowships were awarded to persons from 112 countries and territories for study in 84 other countries and territories. The Organization also continued to assist medical and public health schools by providing visiting professors the number of WHO teaching personnel assigned to educational institutions was 113.



## ATOMIC ENERGY AND HEALTH

Two WHO expert committees met in 1957 to consider respectively the post graduate training of public health workers in the public health aspects of nuclear energy, and the introduction of radiation medicine into the undergraduate medical curriculum. An international training course on radiation protection was held at Mol, Belgium by WHO in association with the United States Atomic Commission and the United States Atomic Energy Commission.<sup>6</sup> WHO fellowships were awarded during the year in different aspects of radiation protection and the medical use of radioisotopes.

Work was started on the formation of an Expert Advisory Panel on Radiation which will assist WHO in matters relating to the health aspects of atomic energy and X

radiation. Co-operation with the United Nations Scientific Committee on the Effects of Atomic Radiation continued and in conjunction with FAO and UNESCO the Organization is preparing background data to assist the Scientific Committee in assessing the probable effects of the disposal of radioactive waste in the oceans. WHO also co-operated with FAO in preparing a paper for the Scientific Committee on calcium components of human diet in various countries. At a conference on the use of radioisotopes in scientific research called by UNESCO WHO arranged for evening lectures dealing with radiation in relation to public health and the clinical uses of radioisotopes. WHO was also represented at the General Conference of the new International Atomic Energy Agency in Vienna.

<sup>6</sup> See CH n. *Wld Hlth Org* 1958 12 37

## EPIDEMIOLOGY AND HEALTH STATISTICS

A revised edition of the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death* was published in English, French and Spanish.<sup>21</sup> *Annual Epidemiological and Vital Statistics* 1954 which also appeared during the year contains data from more countries than formerly as well as additional tables and for the first time statistics of health personnel, hospital establishments and vaccination. In addition to routine information on vital statistics and communicable diseases the monthly issues of the *Epidemiological and Vital Statistics Report* published special collections of data on mortality from certain causes.

Further statistical studies were made showing the suitability of the proportional

mortality ratio (deaths at ages 50 and over as a percentage of total deaths) as an indicator for the component "health including demographic conditions" in the measurement of levels of living. Other studies included the computation of tables for use by water analysts, a guide to statistical methodology applicable to animal work, a discussion of the value of various methods for the refinement of the conventional infant mortality rate<sup>22</sup> and the establishment of indices of epidemicity.<sup>23</sup>

As requested at the Eighth World Health Assembly an annotated edition of the *International Sanitary Regulations* was published in English and French and a Spanish translation was prepared.

<sup>21</sup> *Wld Hlth Org* 1957 17 439

<sup>22</sup> *Wld Hlth Org* 1957 16 763

<sup>23</sup> *Wld Hlth Org* 1957 16 1083

See CH *Wld Hlth Org* 1957 11 374

## DRUGS AND OTHER THERAPEUTIC SUBSTANCES

The WHO Expert Committee on Biological Standardization approved the establishment of International Standards and defined the International Units for pertussis vaccine phenoxymethylpenicillin tetracycline and erythromycin<sup>25</sup> A WHO Study Group on Recommended Requirements for Biological Substances suggested a detailed procedure which WHO might follow in framing and issuing international recommendations on requirements to be observed in the manufacture and control of important biological products

Under an agreement between WHO and the Swedish Apotekarsocietet a Centre for Authentic Chemical Substances was set up in Stockholm for the collection storage and

distribution of a number of chemical reference preparations On the recommendation of the WHO Expert Committee on Addiction Producing Drugs<sup>26</sup> decisions concerning the addiction producing properties of seven drugs were transmitted to the Secretary General of the United Nations

The Organization continued its selection of recommended international non proprietary names for pharmaceutical preparations and work was started on the final text of a Supplement to Volumes I and II of the International Pharmacopoeia A series of studies on synthetic substances with morphine like effect was completed while further information was collected on laboratory methods for the diagnosis of various diseases

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## REGIONAL ACTIVITIES

### African Region

WHO's assistance in the African Region was concentrated chiefly on communicable disease control and on surveys and courses in nutrition although attention was also given to environmental sanitation nursing and maternal and child health Work on leprosy yaws and tuberculosis was extended and there were important developments in investigations of the technical difficulties involved in malaria control During the twelve months ending 30 November 1957 57 projects received assistance from WHO as compared with 36 in the previous twelve months 104 fellowships were awarded during the year

### Region of the Americas

An increase in the regular budget and in contributions to the Special Malaria Fund of the Pan American Sanitary Organization

resulted in a considerable expansion of PASO/WHO assistance to health work in the Americas during 1957 In the field of communicable disease control malaria eradication was given priority and progress was made in campaigns for the eradication of smallpox yaws and the urban vector of yellow fever Further assistance was given for the strengthening of national public health services and the improvement of environmental sanitation while advice was provided on the planning, staffing and reorganization of university courses including those on preventive medicine and for the training of nurses Particular attention was again paid to the training of statistical workers Between 1 December 1956 and 30 November 1957 64 projects received assistance from WHO There was a great increase in the number of fellowships awarded 261 as compared with 159 in the preceding period

## South East Asia Region

The main trend in the programme of the South East Asia Region in 1957 was towards the integration of individual projects into co-ordinated public health services. Thus much of the Region's work consisted in advising and assisting central and state governments and in improving supervision and administration. In South East Asia 127 projects received WHO assistance during the twelve months ending 30 November 1957 as against 123 in the preceding twelve months. Assistance was given chiefly in the control of communicable diseases, the development of rural health services and the training of health workers, particularly nurses. During the year, WHO awarded 90 fellowships to candidates from South East Asia, as compared with 79 in the previous year.

## European Region

The WHO programme in Europe is still fundamentally concerned with assistance to education and training and seminars, conferences, courses and advisory groups were organized on a wide variety of subjects. Long term studies continued on problems common to countries in the Region and several new studies were initiated in 1957. In co-operation with UNICEF new programmes were started in Austria and Morocco respectively for the care of premature infants and the training of public health personnel while a programme for gamma globulin production in Poland was revived. In the Technical Assistance project for the control of communicable diseases in Spain special attention was given to brucellosis. In the twelve months ending 30 November 1957 WHO assisted 69 projects and awarded 420 fellowships in the European Region.

## Eastern Mediterranean Region

During 1957 particular attention was paid to communicable disease control. A special malaria eradication unit was established in the Regional Office while eradication programmes were operating in four countries of the Region and planned in three others. Both malaria eradication and bilharziasis control were increasingly co-ordinated on a regional scale, particularly between countries with common frontiers. In view of the shortage of health workers of all categories special emphasis was laid on education and training and a survey of basic medical education in the Region was planned for 1958. During the twelve months ending 30 November 1957 155 WHO fellowships were awarded and 88 WHO assisted projects were in operation in the Eastern Mediterranean Region.

## Western Pacific Region

Some advance was made during the year in the long term planning of rural health programmes, notably in Cambodia, the Philippines and Viet Nam. Programmes for the control of yaws and malaria were steadily expanded and assistance was given to governments in the strengthening of educational and training facilities. Forty seven projects in the Western Pacific Region were assisted by WHO during the year ending 30 November 1957 and 56 fellowships were awarded in the same period.

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A complete list of the WHO assisted projects in operation from 1 December 1956 to 30 November 1957—country projects, inter country projects and inter regional projects—is included in the Report.

## THE EVOLUTION OF INTERNATIONAL CO OPERATION IN PUBLIC HEALTH

The World Health Organization is the most recent step in an international movement for co-operation in public health which began a little more than a century ago. It is fitting in this tenth anniversary year to look back at WHO's antecedents to trace briefly the path which led to its establishment and to recall the earlier organizations and events which did much to pave the way.

### The International Sanitary Conferences

In the latter half of the nineteenth century a number of International Sanitary Conferences were convened. It was an era of great social and scientific progress and international action on many questions became imperative because of the enormous growth of international intercourse and commerce brought about by developments in transport and communications. The sanitary conferences were prompted by a desire to reconcile commercial and health interests. European governments wished to guard their people against the importation of exotic diseases—"cholera, plague and yellow fever in particular—and at the same time to avoid quarantine restrictions which would unnecessarily interfere with maritime trade.

The First International Sanitary Conference opened in Paris in July 1851. Six months of meetings and hard work on the part of participants from twelve countries—one diplomat and one physician from each—resulted in an international sanitary convention which came to naught because of the failure of most of the countries to ratify it. This and subsequent conference were doomed to failure for a more fundamental reason: however medical science was not yet sufficiently developed to deal with the problems

under consideration and the conference participants doctors as well as diplomats were totally ignorant of the nature and mode of propagation of the diseases they were discussing. At the Second International Sanitary Conference held in Paris in 1859 there were not even any medical delegates present. The convention drafted at this conference was to all intents and purposes "stillborn."

Other International Sanitary Conferences followed in Constantinople in 1866 in Vienna in 1874 in Washington in 1881 in Rome in 1885 in Venice in 1897 in Dresden in 1893 in Paris in 1894 and again in Venice in 1897. Each of these resulted in a convention of limited scope. More significant for the present review is the fact that the need for an international health agency began to be felt at the 1874 Conference a plan for a "permanent international commission on epidemics" was introduced and at the 1881 Conference a proposal for a "permanent international sanitary agency of notification" was put forward.

When the XIth International Sanitary Conference opened in Paris in 1903 it had at its disposal a body of scientifically established and universally accepted facts about cholera plague and yellow fever. Thus the first health conference of the twentieth century marked also a turning point in the scientific study of epidemic diseases. Many of the fundamental problems had been solved but it remained to translate scientific discovery into practical public health measures. This conference unified and revised the previous sanitary conventions and combined them into a single instrument, the International Sanitary Convention of 1903 whose provisions related to cholera and plague.

It was also at this conference that plans for the first international health agency were formulated. A committee charged with

Abridged from World History: The Story of the People of the World and a Geography of the World (see Part 3 of his number 1 of The Atlantic)

studying a French proposal for an international health office recommended that such an office be created that it be patterned after the International Bureau of Weights and Measures and that it be located in Paris. Four years later in December 1907 this recommendation became a reality when delegates of twelve States signed an agreement in Rome for the creation of the Office International d'Hygiène Publique (OIHP).

## The OIHP

The structure and function of the OIHP warrant some description since they provided to a certain extent a precedent for those of the World Health Organization.

The new office was under the authority and control of a committee of delegates of member governments and it was stipulated in its Constitution that these delegates should be "technical representatives of their countries." However, this term was widely interpreted for although most of the first members of the "Permanent Committee" were medically qualified several were diplomats. States which had not signed the Rome Agreement could adhere to it on application thus accepting the obligation to contribute to the budget of the OIHP and obtaining the right of representation on the Permanent Committee. The Constitution of the OIHP laid down that it should not in any way interfere with the national administrations and proclaimed its independence from the authorities of the country in which it was situated. It also established its right to communicate directly with national health administrations.

As its main function the OIHP was to disseminate to Member States information of general public health interest and especially that relating to communicable diseases—notably cholera, plague and yellow fever—and the measures taken to combat them. It was also to suggest improvements to the International Sanitary Conventions and to publish a monthly bulletin.

At first the OIHP was largely an European agency but the ultimate adherence to the Rome Agreement of nearly sixty countries (some of which were not however sovereign States) gave it a more truly international character.

The early years of the OIHP's existence coincided with a period of scientific develop-

ment and growth of the public health professions which made possible important advances in the control of some of the major communicable diseases. The minutes of the meetings of the Permanent Committee during these years furnished an excellent picture of the state of the public health sciences at the time and the monthly Bulletin of the OIHP was a unique source of information on a wide range of public health subjects.

A report on the first major technical problem to be studied by the Permanent Committee gave rise to a question of principle which was to be discussed more than once by the World Health Assembly and the WHO Executive Board over forty years later. Dr. H. Pottevin, the Secretary General, had prepared a comprehensive report on the destruction of rats on board ship and the prevention of their migration from ship to shore and *vice versa* and although his report was generally approved by the Committee, doubts were expressed as to the wisdom of publishing it since it was feared that the OIHP might thereby commit itself to certain responsibilities. The solution adopted was one to which WHO has also had recourse on many occasions: the report was sent in proof form to all delegates and their observations were taken into account in preparing the final text.

The OIHP did not engage in field work but it did provide an international information bureau and a forum for the discussion of public health problems. Among the subjects which it studied were deraiding yellow fever, plague, cholera, malaria, tuberculosis, typhoid fever, ankylostomiasis, cerebrospinal meningitis, sleeping sickness, the suppression of insect vectors of disease, food hygiene, the construction and management of hospitals, the hygiene of schools and workshops and biological standardization.

By the time it was forced to suspend activities in 1914 on the outbreak of war, the Permanent Committee of the OIHP had prepared a revision of the International Sanitary Convention of 1903 which resulted in the International Sanitary Convention of 1912, the first to include yellow fever as a quarantinable disease. In addition it had

made important recommendations to governments on a wide range of public health problems. Despite the suspension of activities the Bulletin continued to be published regularly during the five years of war.

At its first post war session on 3 June 1919 the Permanent Committee of the OIHP heard in an address by its President Professor Rocco Santoliquido a statement of international public health principles which were still considered valid and even new more than thirty years later. Professor Rocco Santoliquido said that the chief guarantee of international security against disease lay in the standard of public health of each national unit and that the idea of erecting barriers against disease and the concept of quarantine were outmoded. Endemic foci of communicable disease should be circumscribed and obliterated and such action presupposed a considerable and rational development of national health services. The health measures taken must be adapted to local circumstances and what was suited to a large town would not be applicable to a small rural community. Further it was not sufficient that the health services be developed and reorganized; the people must accept the necessity for the measures taken and this meant that they must be aided through education to understand such measures.

These principles have become a "corner stone of international health work."

### The Health Organisation of the League of Nations

Though the OIHP seemed destined for expansion it was in fact to see its activities somewhat diminished because of the creation of a health organization within the framework of the League of Nations.

The Covenant of the League of Nations provided in Article XXIII(f) that Members should "endeavour to take steps in matters of international concern for the prevention and control of disease." Though there is no clearly stated reason in the published records why it was considered necessary for the League of Nations to concern itself with

health matters when the OIHP was already functioning as an intergovernmental organization devoted to international health co-operation several factors would seem to have played a part in the decision to include health in the Covenant. First there was a general feeling that all international activities should be co-ordinated through the League. Secondly the state of health of the world at the end of the war called for action on a scale for which the OIHP with its small staff and modest budget was ill equipped.

In late July 1919 at an informal meeting in London of delegates from France, the United Kingdom and the United States and of representatives of the League of Red Cross Societies and of the OIHP it was recommended that the OIHP should continue to exist but that it should be placed under the authority of the League of Nations. The Permanent Committee of the OIHP later agreed to this proposal.

At the request of the Council of the League of Nations an International Health Conference was called in London in April 1920 to draft plans for a new permanent international health organization and to deal with the emergency of epidemic typhus in Poland by preparing plans for united official international action.

The Conference recommended that a permanent international health organization be established as part of the League of Nations. This organization was to comprise an Executive Committee, an International Health Bureau and a General Committee; the last to consist of delegates of Member countries of the League and of countries not Members but represented on the Permanent Committee of the OIHP. Subject to the consent of the signatories of the Rome Agreement of 1907 the OIHP was to become part of the new international health organization and the necessary changes that this entailed were to be made in its constitution. This plan was approved by the Council of the League and subsequently by the first Assembly of the League with one slight alteration namely that the "Executive" Committee became a "Technical Committee."

With regard to its second purpose the Conference expressed the opinion that the League was the "sole organization sufficiently strong and authoritative to deal effectively with the typhus epidemic in Poland. While endorsing the measures already undertaken by the Polish authorities the Conference estimated that additional supplies requiring an expenditure of more than three million pounds sterling were needed. The urgency of the situation made it imperative that the League's health work be started before all the members of the OIHP could agree to the Office's subordination to and eventual absorption by the new League health organization.

Accordingly the Secretary General of the League of Nations submitted on 11 March 1921 to the President of the Permanent Committee of the OIHP a proposal for the establishment of a temporary Technical Committee on which the Permanent Committee of the OIHP was to be represented. This proposal was rejected by the Permanent Committee at its April session partly because of a communication indicating that the Government of the United States could not consent to any international organization of which it was a member being combined with the League of Nations. This decision meant that two autonomous international health organizations one in Paris and the other in Geneva were to function concurrently for more than twenty years.

The early attempts of the League to embark on health work were beset by legal complications but with an important consequence in an effort to secure the representation of the OIHP if only in an advisory capacity the first successful committee of the League was composed of members selected on the basis of technical qualifications rather than nationality. Of the twelve members of the Provisional Health Committee of the League seven were also members of the Permanent Committee of the OIHP. At the fourth session of the League's Committee in August 1921 the word Provisional was dropped and the Committee became known as the Health Committee of the League of Nations. The principle of appointing a standing com-

mittee of health experts in their personal capacities did not survive the establishment of the Health Organisation of the League in its definitive form but a similar principle was later to be used in the constitution of the Executive Board of the World Health Organization.

It was not until 1923 that the Health Organisation of the League of Nations actually began to take shape. In its ultimate form it consisted of a General Advisory Health Council, a Health Committee and a Health Section of the Secretariat of the League. The problem of adjusting to and co-ordinating with the OIHP continued to complicate the situation though the OIHP retained its largely nominal function as the General Advisory Health Council of the League's Health Organisation.

#### International health work between two world wars

During the period between the two world wars the OIHP maintained and to some extent developed its traditional functions. The Health Organisation of the League of Nations sought opportunities for useful work by evolving new methods and extending the field of international health work to new subjects.

One of the tasks of the OIHP was the revision of the 1912 Convention which resulted in the International Sanitary Convention of 1926. In the new Convention the number of quarantinable diseases was increased to five by the addition of smallpox and typhus and the OIHP assumed a more active part in international efforts to limit the spread of epidemics. Countries were required to notify the OIHP immediately of first cases of plague, cholera and yellow fever and of the appearance of typhus and smallpox in epidemic form. The Office was in turn to relay this information by telegram to all countries whose geographical situation or maritime relations placed them in danger. From such notifications a weekly communique was prepared. The OIHP also collected regularly from governments certain other information which was later organized and

published as the *Annuaire sanitaire maritime international*. Two further publications were subsequently added to this—a *Relevé annuel* relating to the deratting of ships and ports and a *Repertoire sanitaire maritime international*.

In 1928 the OIHP established a Pilgrimage Commission to examine the report on the Mecca Pilgrimage prepared each year by the Egyptian Sanitary Maritime and Quarantine Board, one of several regional organizations to which the Office delegated certain functions. In the same year the Permanent Committee began study of a question of rapidly increasing importance—the quarantine regulations for air traffic. By 1932 the International Sanitary Convention for Aerial Navigation had been drawn up; this was signed by twelve countries in the following year and came into force in 1935 when ten countries had ratified it.

In sum the OIHP was principally concerned with the supervision and improvement of international quarantine measures. But its work also included other aspects of public health, notably the Brussels Agreement of 1924 regarding venereal diseases among seamen, the international standardization of anti-diphtheria serum and the control of narcotic drugs. In addition it collected information from member countries on many subjects and published it in its monthly Bulletin.

The Health Organisation of the League first directed its efforts towards meeting the emergency situation created by the epidemics which followed the war, particularly the typhus epidemics in Eastern Europe. It set up an Epidemic Commission to visit and advise the health authorities of affected countries and an epidemiological intelligence service to collect and publish data on epidemic diseases of international importance. It included in its *Weekly Epidemiological Record* the communiqués prepared by the OIHP. Because of the relative prevalence of the epidemic diseases in Asia, the Health Organisation established an Eastern Bureau in 1925.

A new approach to the international control of communicable diseases started in 1923

with the setting up of the League's Malaria Commission, the purpose of which was not to prevent the spread of the disease from one country to another, but rather to study and advise on the best means of controlling malaria wherever it existed. One significant result of these studies was the introduction of totaquina as an effective but less expensive substitute for pure quinine.

In 1923 the Health Organisation also established a Cancer Commission, the work of which led to a series of annual reports on the results of radiotherapy in cancer of the uterus. Other technical commissions were eventually set up to study a wide range of subjects including biological standardization, housing, physical fitness, typhus, leprosy, medical and public health training, rural hygiene and unification of pharmacopœias. Particularly outstanding was the Organisation's work on nutrition. In 1936 it published a report on the physiological bases of nutrition which attracted much attention and which can still be regarded as a document of historic importance.

With the outbreak of the Second World War international health work again all but ceased. However the Health Section of the League dealt with requests for information to the extent that its limited resources permitted. Several numbers of the *Bulletin of the Health Organisation* were published among them some containing studies of special health problems created by the war and publication of the *Weekly Epidemiological Record* was continued without interruption.

In May 1944 the two officers who constituted the nucleus of the Epidemiological Intelligence Service of the League of Nations Health Section were transferred to the United States to form a "research unit"—and later to organize an epidemiological intelligence service—in the Health Division of the United Nations Relief and Rehabilitation Administration (UNRRA). In January 1945 UNRRA took over the OIHP's duties with respect to the International Sanitary Conventions. UNRRA was a temporary organization created to deal with the devastation resulting from the war. One of its primary



concerns was public health and the work of its *Health Division* in combating epidemics administering the *International Sanitary Conventions* providing essential medical supplies and aiding governments of fifteen countries to rebuild and even improve their health services provided an invaluable link between pre and post war intergovernmental health activities

### Establishment of the World Health Organization

The period of the Second World War saw advances in medical science which were to revolutionize methods of controlling certain communicable diseases the advent of penicillin and of DDT, in particular was to transform the outlook for some of the major public health problems completely

The importance of health in rebuilding world peace was recognized at the United Nations Conference held in San Francisco in 1945 A memorandum submitted by the Brazilian delegation led to the insertion in the United Nations Charter of health as one of the problems to be considered by the United Nations and a later joint declaration by the Brazilian and Chinese delegations recommended the early convocation of a general conference for the purpose of establishing an international health organization Subsequently, the UN Economic and Social Council as one of its first tasks adopted on 15 February 1946 a resolution calling for an international conference to establish a health organization and setting up a technical preparatory committee composed of individuals chosen for their expert qualifications to prepare an agenda and proposals for consideration by the conference The Secretary General of the United Nations was requested to call the health conference no later than 20 June 1946

The accomplishments of the Technical Preparatory Committee which met in Paris

in March and April 1946 were considerable in the course of only twenty two meetings it drew up an annotated agenda for the conference proposals—amounting to a draft—for a virtually complete constitution for the new health organization and a series of relevant resolutions It was this committee which proposed what was to become essentially the structure of the future World Health Organization and which threshed out details which greatly facilitated the work of the International Health Conference

The International Health Conference opened in New York on 19 June 1946 and was in session for four and a half weeks All fifty one Members of the United Nations were represented and thirteen non Member States were also represented by observer on invitation of the Economic and Social Council

The Conference's decisions resulted in the Constitution of the World Health Organization a protocol for the termination of the Rome Agreement of 1907 and for the assumption by the new Organization of the duties and functions of the OIHP and the establishment of an Interim Commission to carry on the health work of former international organizations—the League of Nations Health Organisation the OIHP and UNRRA—until the coming into force of the Constitution The Interim Commission was empowered to take any necessary action to further the solution of urgent health problems and its final task was to make arrangements for convening the First World Health Assembly including the preparation of the provisional agenda The Constitution was signed by sixty one States on 22 July 1946 but nearly two years elapsed before its final ratification on 7 April 1948 During this time the Interim Commission more than fulfilled the duties and obligations assigned to it and provided a solid foundation for the subsequent work of the Organization

# THE STRUCTURE AND WORKING METHODS OF THE WORLD HEALTH ORGANIZATION

The task which faced WHO as a truly international health agency intended to carry on the functions of its predecessors but to work on a much larger scale than any of them was immense. It is greatly to the credit of those who drafted its Constitution that the structure and functions set forth therein have proved in the course of the first ten years to be so well conceived. It was essential to create a structure simple and flexible enough to adapt to changing needs and gradual expansion and this the "founding fathers" succeeded in doing.

## ORGANIZATIONAL STRUCTURE

### The Health Assembly

To enable its Members which now number 85 (plus three Associate Members) to have a direct voice in planning and financing world wide mutual assistance in health programmes WHO convenes an annual World Health Assembly. Each Member is entitled to be represented at the Health Assembly by three delegates one of whom must be selected as chief delegate. The delegates are chosen for their technical competence in the field of health and should preferably represent national health administrations.

The functions of the Health Assembly are to determine the Organization's policies; to make recommendations to Member States to approve a general programme of work and to give instructions or directives to the Executive Board and the Director General; and to review and approve the budget. It elects the Director General and chooses the States entitled to designate a person to serve on the Executive Board.

In addition the Health Assembly has a certain quasi-legislative power which is new

in international organization and which greatly facilitates the acceptance by governments of international health regulations with a minimum of delay. The Assembly is "empowered to adopt by resolution regulations relating to a broad range of specified technical subjects" and these regulations come into force within a stated period after notification of their approval by the Assembly for all Member States except those which have indicated their rejection of them or their acceptance subject to certain reservations. This power has been employed by the Assembly in the adoption of the International Sanitary Regulations and of regulations regarding nomenclature with respect to diseases and causes of death.

### The Executive Board

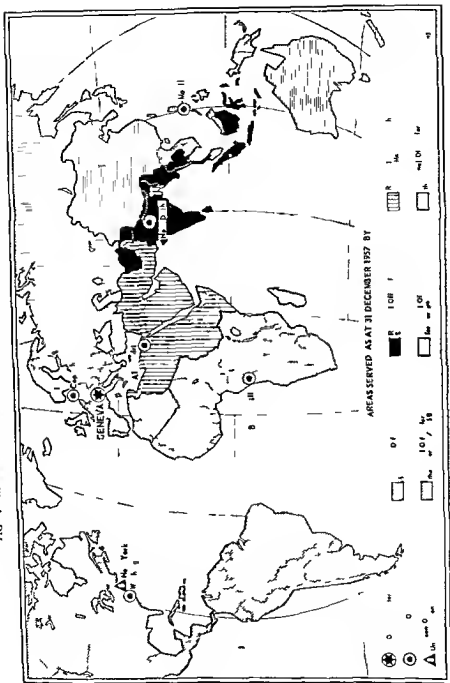
The Executive Board is composed of eighteen members designated by as many Member States. Its members are selected on the basis of technical competence and exercise the powers delegated to them by the World Health Assembly on behalf of the whole Assembly, not as representatives of their respective governments. The Board members are in effect the trustees of the Health Assembly.

To ensure continuity in its work the Board is subject to renewal by only one third every year. However Member States are eligible for re-election as States entitled to designate a person to serve on the Board (see Table 1). Every effort is made to provide a balanced geographical distribution of its members.

The Constitution empowers the Executive Board "to submit proposals and advice to the Assembly on its own initiative; prepare general programmes of work for approval by the Assembly and take or authorize the Director General to take any action required in an emergency e.g. an epidemic or a calamity. It also exercises on behalf of the



FIG 1 REGIONAL STRUCTURE OF THE WORLD HEALTH ORGANIZATION



Services which deals mainly with direct services to governments and the Department of Central Technical Services which includes the epidemiological intelligence and statistical services biological standardization the unification of pharmacopoeias publication and reference services and other activities of world wide scope

In the first few years of the Organization's work direction was concentrated largely at Headquarters. Gradually however WHO's distinctive decentralization scheme began to take shape. Today the Organization has six regional offices for Africa the Americas South East Asia the Eastern Mediterranean Europe and the Western Pacific (Fig 1). While some of the functions formerly fulfilled by Headquarters have been assumed by the regional offices co ordination top level technical guidance and financial control have remained the prerogatives of the central office in Geneva. The chief purpose of the regional offices is to provide effective contact between the Organization and the governments within each region. Since the six regions are very different from each other the structure and working methods of the regional offices vary

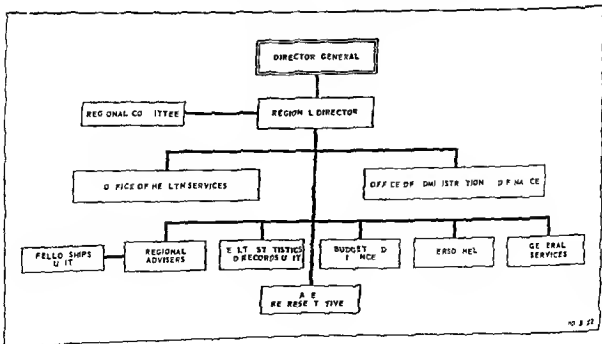
considerably. Nevertheless they do all follow the same general pattern and the structure of a typical office is shown in Fig 2.

The staffing of an international agency such as WHO is not easy. Two considerations must govern the selection of personnel: technical competence and geographical representation. The two are sometimes difficult to reconcile. It is impossible for all Member States to be represented on the staff since in some countries the relative shortage of trained and experienced health personnel makes it essential to retain those that are available in the national or local health services. Another problem stems from the far flung nature of the Organization's operations: it is especially difficult to maintain a sense of unity among a staff of diverse professional and national backgrounds when this staff is working in perhaps over a hundred places.

In brief the WHO Secretariat is composed of a number of categories of staff recruited from many countries.

These categories consist broadly speaking, of the technical officers at Headquarters and at regional offices, the technical specialists appointed to give

FIG 2 TYPICAL STRUCTURE OF A REGIONAL OFFICE



advisory and demonstration services to governments on the spot. The administrative officers, the locally recruited secretarial and general service staff, the short-term specialist consultants, either at Headquarters or in the regions and in the field and fully temporary and *ad hoc* staff engaged for special purposes such as conferences. The staff has grown in numbers from some two hundred persons in 1948, mostly centrally located to over one thousand five hundred in 1958, distributed in fairly equal proportions among Headquarters, the regional offices and the field. It comprises on the technical side medical and scientific officers, public health engineers, nurses, health educators, veterinarians, statisticians and technicians on the administrative side language and library staff, information and liaison officers, legal, financial personnel and other administrative officers of a host of kinds and secretarial, clerical and operative staff.

## WORKING METHODS

### Preparing the programme

Once a workable organization had been established the Executive Board and the Director General turned their attention to drafting a suitable programme of activity—a programme encompassing as many of the Organization's constitutional functions as feasible within the limits of the available resources. Accordingly a plan of work was developed which the Organization could carry out over a period of several years in the light of current medical knowledge. This plan was based on five general principles: (1) all countries and territories should take part in the Organization's work; (2) assistance to a government in the development of its health services should be supplied only on the request of the government concerned; (3) the services afforded should be calculated to foster national and local self-reliance and initiative and should be adapted to the environment; (4) the Organization should limit its efforts on behalf of research to stimulating and co-ordinating current efforts; (5) services should be available to all Member States.

Within the framework of a general programme based on the above principles the Director General drafts annual programmes and budgets. Regional organizations aid by

assessing national needs, receiving government requests for assistance and deciding on priorities among projects suitable for their regions.

Certain criteria have been established for determining whether a proposed activity should be rejected or accepted. WHO embarks only upon programmes considered internationally feasible: a country must be able to participate in the work and to continue it after WHO aid has been withdrawn; the activities should as far as possible be capable of yielding demonstrable results; the work should directly or indirectly benefit the largest possible number of countries and people; the qualified staff required should be available; a full preliminary study should be made before any commitment to action is accepted; account being taken of factors such as work already done on the same subject by WHO or another organization; the possibility of financial or other assistance from sources other than the United Nations and its specialized agencies; and whether or not WHO is the organization best suited to do the work. Consideration has to be given also to the world-wide technical services which only an international organization such as WHO can perform. In general the Organization's activities come under two main headings: strengthening of national health services and services of general international interest.

The annual programme and budget estimates are prepared nearly two years before the calendar year for which the programme is intended. In the "planning year" the Director General "sends to departments and offices at Headquarters and to each of the regional offices a directive on the various policy considerations to be taken into account in planning the programme; an indication of the tentative allocation of funds and instructions on the form in which the estimates are to be prepared. In the same year the regional directors consult with governments and receive their requests for assistance." The regional programme is planned on the basis of these requests. The Director General "reviews all proposals from regional offices and headquarters departments and

decides which activities are to be included in his proposed annual programme and budget estimates

The proposed programme and budget estimates are subjected to a detailed examination by the Executive Board's Standing Committee on Administration and Finance which makes suitable comments and recommendations to submit with the programme and budget to the World Health Assembly. The programme as approved by the Health Assembly is carried out in the following year.

### Financing the work

The principal financial resources of the Organization are the contributions from Member States and the funds placed at its disposal under the United Nations Expanded Programme of Technical Assistance. In the early years of its existence WHO had a grant from UNRRA and funds from the assets of the Office International d'Hygiène

Publique. In recent years there have been contributions to a special fund for malaria eradication. The United Nations Children's Fund (UNICEF) has for many years met a large share of the expenses of projects in which the two agencies have worked together.

The contributions of Member States are determined by a scale of assessment patterned after that used by the United Nations. Funds made available under the Expanded Programme of Technical Assistance are a valuable source of income but it is somewhat difficult to plan for health work under this programme since the amount that will be available for any year is accurately known only six months after the programme for that year has been considered by the Health Assembly. The working relationship between WHO and UNICEF will be discussed in more detail in a later section.

A government requesting WHO aid in a health project whether in the form of advice, staff fellowships or occasionally some

TABLE 2 REGULAR BUDGETS 1948-1958

Year	Budget level	Authorized expenditure level	Actual expenditure
1948 (four months)	4 800 000	4 800 000	3 935 53
1949	5 000 000	5 000 000	4 700 743
1950	7 501 500	6 000 000	6 269 77
1951	7 677 401	6 527 401	6 016 296
1952	9 100 33	7 700 33	6 970 019
1953	9 832 754	8 485 095	8 018 456
1954	9 838 000	8 497 700	8 134 514
1955	10 999 360	9 500 000	9 275 300
1956	12 074 144	10 203 000	9 982 794
1957	13 500 400	12 500 000	12 091 000
1958	14 769 160	13 500 000	13 500 000

The difference between the budget level and the authorized expenditure level is accounted for by the need to make allowance for no payment of contributions by certain Member States and slow payment of payments by other Member States.

Including repayment to the United Nations of the \$2 150 000 lent to the Interim Commission.  
Subject to audit.

equipment and supplies is responsible for the project undertaken and provides resources in money manpower and material to an amount which usually increases as the project advances and which several times the amount spent on the project by WHO. Because of its very limited budget the Organization's assistance must be largely technical not financial.

The regular budgets of the Organization for successive years are shown in Table 2.

The funds which WHO has obligated under the Expanded Programme of Technical Assistance are indicated below.

	US \$	
1950-51	1 34 490	
1952	4 351 689	
1953	4 189 357	
1954	3 754 545	
1955	4 411 749	
1956	5 450 454	
1957	5 523 144	subject to audit

### Co-operation with other organizations

WHO does not work alone it has close working relationships with the United Nations and its various agencies and co-operates with other inter governmental and non governmental organizations.

The Organization's Constitution prescribes that it shall establish and maintain effective collaboration with the United Nations specialized agencies governmental health administrations professional groups and any other appropriate organizations and promote co-operation among scientific and professional groups which contribute to the advancement of health. In agreements with the United Nations the Food and Agriculture Organization (FAO) the International Labour Organization (ILO) and the United Nations Educational Scientific and Cultural Organization (UNESCO) provision is made for reciprocal representation at meetings the establishment of joint committees for special purposes (except in the case of the United Nations) the exchange of information and documents the co-ordination of personnel arrangements (especially for the avoidance of competition in

recruitment and for facilitating interchange of staff) and the co-ordination of statistical services with a view to ensuring the maximum technical efficiency and the avoidance of overlapping. WHO reports yearly to the United Nations Economic and Social Council and participates in a number of activities common to the United Nations and several of the specialized agencies.

WHO's collaboration with UNICEF has been particularly close. When the Fund was created in 1946 as an emergency measure to help meet the needs of children and adolescents in a war-devastated world it was arranged that it should utilize as much as possible the staff and technical assistance of the specialized agencies. The Interim Commission seconded a full time medical officer and a paediatrician to work with UNICEF and gave technical support to UNICEF's mass BCG vaccination campaign.

In the early days of WHO a UNICEF/WHO Joint Committee on Health Policy was set up to direct health work in which the two agencies would co-operate. According to principles laid down by this committee UNICEF's role in health programmes "is to furnish under its agreements with governments the required supplies and services while WHO will study and approve plans for all health programmes for which countries may request supplies from UNICEF. WHO will also be responsible for making available to governments at their request international health experts to help in drawing up plans of operation for UNICEF health programmes or for the implementation of any health programme." This position has remained essentially unchanged today. WHO provides the international health personnel and UNICEF the supplies in projects in which the two work together. UNICEF also defrays the costs of any international health personnel which could not have been foreseen at the time of preparation of the WHO budget estimates.

The achievements of WHO and UNICEF in their joint projects have been noteworthy and have covered practically every field of interest to child health.



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1955	10 999 360	7 500 000	9 275 300
1956	12 074 144	10 203 000	9 982 794
1957	13 590 470	11 500 000	2 091 471
1958	14 709 160	3 466 133	—

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Subject to audit.

for co-ordinated research. The educational meetings usually take the form of conferences or seminars; the former are usually on a larger scale than the latter and serve chiefly the purpose of exchange of information; the latter normally are concerned with narrower subjects and result in some concrete conclusions on those subjects which may be generally disseminated.

#### *Training methods*

In addition to the aforementioned educational meetings and demonstration projects WHO utilizes fellowships and training courses to carry out its education and training programme. The Organization has developed a comprehensive system of fellowships in which it acts largely as a coordinator; it arranges for fellows selected by governments to study in institutions in other countries where training is available that cannot be obtained locally. It also arranges for teachers to go to countries that need help in improving their educational facilities.

WHO often with the aid of other agencies sponsors short training courses on a wide variety of subjects and provides fellowships for trainees from different countries to attend and in collaboration with certain governments the Organization assists in

professional training courses in special fields such as anaesthesiology.

#### *Investigation and research techniques*

WHO draws upon and helps to coordinate the medical resources of the world through co-operative arrangements among medical services and scientific workers everywhere. In certain fields it has established a network of laboratories for reference and exchange of information; in some instances paying annual grants to national institutions participating in international work or assisting in other ways such as by facilitating an exchange of workers or providing essential supplies. In other domains the Organization uses research institutions made available to it by national authorities for conducting specific investigations.

#### *Publications*

Both in its general technical services for all countries and in its direct services to individual countries WHO uses publications to further its ends. Much of the Organization's work would be of little value or even impossible without the permanent record and means of diffusing and exchanging information afforded by its publications.

## THE WHO FELLOWSHIPS PROGRAMME<sup>1</sup>

When the Interim Commission was formed in 1946 to continue the work of former international health organizations pending ratification of WHO's Constitution it also took over the fellowships programme initiated by UNRRA. This programme has become one of the basic features of the work of WHO and as Table I shows the number of fellowships awarded annually has increased sevenfold in the eleven years from 1947 to 1957.

The article, based on the report of the Director-General to the Eleventh World Health Assembly, is published in the Information Bulletin of the Organization, No. 1, 1958, p. 1. The full text of the report is available in the WHO Library.

The main object of the fellowships programme is to provide selected health personnel with advanced training abroad, which is not available in their own countries and which is necessary for a specific assignment on return. In this way technical skill and knowledge accruing or accumulated anywhere in the world is made accessible to others and it is possible to build up in each country an élite of personnel highly trained in all categories of health work who can undertake the training of their compatriots. Naturally the selection of suitable candidates is all important for the success of the programme and certain guiding principles were recommended by the Expert Committee

Special mention may be made of WHO co operation with two other agencies the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) in the health programme of which the Organization has actively participated and the United Nations Korean Reconstruction Agency (UNKRA) for which WHO has provided medical personnel

Non governmental organizations concerned with some particular branch of medical science or with other subjects of general interest to WHO may be admitted into official relationship with the Organization by decision of the Executive Board. This arrangement entitles the organization in question to appoint a representative to participate without right to vote in WHO meetings and on the invitation of the chairman to address the meeting on a subject in which it has a particular interest to have access to certain documentation and to submit memoranda to the Director General. WHO benefits from these relationships in various ways—for example through assistance in sponsoring conferences and other types of technical meeting.

### Means to an end

Many of the means which WHO employs to accomplish its purposes have been used by previous health organizations or by private agencies rendering health assistance though on a much smaller scale. These means to an end include projects, technical meetings, fellowships, co ordination and co operation among medical services and individuals, specific investigation and research techniques and dissemination of information through publications.

### Projects

Direct advisory services to governments are based on the administrative and technical unit known as the project. A project usually evolves as follows:

To meet a request from a country the regional director negotiates with the national authorities to determine the form of international assistance to be supplied. A suitable expert or team is then recruited

by the Organization and briefed on the purpose of the project, the conditions in the region and country and the general administrative and technical procedures that the Organization has found useful in similar circumstances. The regional office assists in the necessary liaison and co operation with the national counterparts and local services with which the expert or team will work. The international staff is assigned to assist the government, not to control the project, and the course of the project is thus determined by the local needs, environment and epidemiological conditions.

A system of reports to the national health administrations and to the Organization's regional office ensures that the projects are properly developed or modified as circumstances change during their progress. When the international staff is withdrawn the local services apply, extend and continue the work as necessary so that it becomes an integral part of the national health services.

Most projects more or less become local demonstrations in which the international staff provides technical guidance, demonstrates particular techniques and trains national counterparts to carry on and extend the work. In some cases the demonstration assumes the proportions of a "mass campaign" making an all out attack on a specific health problem (e.g. tuberculosis or the treponematoses) reaching as many people as possible within a relatively short time and preparing local personnel to utilize the same procedures in other areas and to do follow up work. Special types of demonstration (e.g. laboratory, clinical and field demonstrations and technical meetings and courses of various kinds) may be used to assist several countries from one or more regions with some common problem.

### Technical meetings

Technical meetings are among the Organization's most valuable working tools. Such meetings may be either advisory or educational in nature. In the first category are meetings of study groups and of expert committees drawn from the Organization's 36 expert advisory panels. These meetings provide authoritative technical direction to the policies and programmes of the Organization and afford an opportunity for an exchange of information and suggest outlines



TABLE 1 ANNUAL DISTRIBUTION OF WHO FELLOWSHIPS BY SUBJECT OF STUDY 1947-1957

Purpose of Study	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	Total
<b>HEALTH ORGANIZATION AND SERVICES</b>												
Public Health Administration												
Public Health Administration	18	17	14	24	68	89	113	108	103	137	141	831
Hospital and Medical Care Administration	3	11	4	2	11	20	8	7	18	16	2	107
Hospital and Clinical Buildings	1	—	2	2	—	3	—	2	5	1	23	39
Medical Librarianship	—	1	—	1	1	5	2	—	1	3	4	18
Sanitation												
Environmental Sanitation	4	1	5	41	51	76	57	52	107	104	97	595
Housing and Town Planning	—	—	—	1	—	1	1	—	1	—	2	5
Food Control	—	—	—	5	1	4	13	7	15	4	10	53
Nursing												
Nursing and Midwifery	2	3	2	6	19	60	49	5	59	48	81	344
Public Health Nursing	3	6	3	48	17	25	33	22	5	44	42	253
Medical Social Work	1	3	—	—	2	1	—	—	3	1	1	12
Maternal and Child Health												
Organization of Maternal and Child Health Services	10	7	20	14	44	78	45	30	48	66	78	441
Paediatrics and Obstetrics	13	9	6	45	36	70	6	26	31	25	34	272
Other Health Services												
Mental Health	5	9	11	11	61	98	61	26	33	20	4	413
Health Education	4	2	—	1	9	12	9	9	21	24	35	127
Occupational Health	2	10	3	1	15	58	1	8	41	23	88	208
Nutrition	3	4	7	8	17	37	12	8	29	7	34	166
Health Statistics	4	1	—	7	9	2	21	42	49	39	54	298
Dental Health	1	4	3	2	7	7	4	2	6	13	17	66
Rehabilitation	3	6	7	6	30	45	15	18	11	16	37	194
Control of Pharmaceutical and Biological Preparations	—	1	—	1	4	9	2	5	8	11	10	57
Total	77	95	87	276	422	669	513	397	670	603	831	4570
	39	42	39	57	68	59	57	6	61	65	59	59
<b>COMMUNICABLE DISEASE SERVICES</b>												
Communicable Disease and Laboratory												
Malaria	1	3	25	15	16	38	57	40	72	51	49	377
Venereal Diseases and Treponematoses	4	6	27	45	19	64	5	31	23	8	14	276
Tuberculosis	6	13	29	31	55	59	94	3	81	45	57	541
Other Communicable Diseases	13	22	8	12	8	130	61	40	76	47	169	606
Laboratory	16	14	10	21	19	47	35	40	41	39	103	345
Chemotherapy and Antibiotics	1	2	—	3	—	8	10	1	—	—	—	5
Total	43	60	98	121	131	346	293	225	293	190	33	1003
	22	26	44	32	21	39	32	31	9	21	28	8
<b>MEDICAL EDUCATION, CLINICAL AND BASIC MEDICAL SCIENCES</b>												
Clinical Medicine												
Surgery and Medicine	18	3	6	15	28	37	8	25	30	37	57	301
Anaesthesiology	—	7	1	—	14	29	17	16	19	12	22	144
Radiology	8	7	—	1	5	4	7	3	5	5	17	66
Haematology	3	2	—	—	—	—	1	6	3	5	5	35
Other Medical and Surgical Specialties	34	19	16	9	13	41	34	18	22	14	4	244
Basic Medical Sciences and Education												
Basic Medical Sciences	14	21	12	2	5	9	8	10	12	16	33	149
Medical Education	—	—	4	4	7	5	4	16	16	22	19	97
Total	79	73	39	43	73	118	99	94	107	111	177	1073
	39	32	17	11	11	11	13	10	10	14	13	103
Grand total	193	238	224	396	666	1143	904	716	1070	904	1400	7706

on Professional and Technical Education of Medical and Auxiliary Personnel in 1950". The Committee stressed the importance of training in public health and the need for the adequate recognition of the non medical aspects of health protection particularly nursing environmental sanitation education of the public and the social aspects of medicine. It will be seen from Table 1 that during the last few years some 60% of the fellowships awarded have been for public health administration sanitation nursing maternal and child health and other health services. On the other hand the number of fellowships given annually for study in clinical medicine the basic medical sciences and medical education which represented nearly 40% of the total in 1947 fell to 11% in 1950 mainly because of a reduction in clinical studies and has remained at or near this figure ever since. Fellowships for study in communicable disease services have constituted around 25% of the total throughout the entire period under review although the actual number awarded in 1957 was nearly nine times as many as in 1947.

The Expert Committee also recommended that in selecting candidates preference should be given to persons who upon return from fellowship training will assume positions of responsibility in teaching and that careful attention should be given to assurance that the Fellow will upon return to his country have the necessary facilities equipment and opportunity to work along the lines of his fellowship study. The extent to which these conditions are met is the use to which the fellow subsequently puts the knowledge he has required is in fact the yardstick used to evaluate the success of the fellowship programme. Two years after the fellow's return home a follow up report is obtained accompanied by a statement from the national health administration which requested the fellowship and supplemented if possible by first hand information from WHO regional and field staff. On the basis of this information an evaluation note is prepared giving a positive or negative appraisal on about

fifteen items covering the fellow's studies his employment and the contribution he made to his country's health after his return.

Table 2 shows the results of the evaluation of 1053 fellowships awarded during the period 1947 to 1954. It will be seen that taking all the countries together 961 (92%) of the fellows were in employment that was considered appropriate to their studies and that about one third of these had gained promotion or been given additional responsibility another 133 (14%) had been able to take up

TABLE 2. EVALUATION OF 1053 FELLOWSHIPS AWARDED BETWEEN 1947 AND 1954

	Number	
1. Fellowships in employment	961	92%
Widely employed	323	34%
1. a. Widely employed for health	33	14%
2. Fellowships in employment		
2. a. Widely employed for health	65	64%
2. b. Widely employed for health	1	1%
2. c. Widely employed for health	72	43%
2. d. Widely employed for health	223	23%
2. e. Widely employed for health	254	26%
2. f. Widely employed for health	50	6%

Th 10 22 11 w t cl d 8 wh h i t m d  
b d d 10 wh h t l d i p f i al  
l d ft tu n g h m e l i h try es g n d  
ly t d rectly l d t h d 20 wh m p l y m t i  
p m t u l i m Th i d th u g h w t  
l d f d th f d i g w i m p l y d i

a new type of activity as a result of their fellowship training. It is particularly satisfying to note that nearly 80% of the 961 fellows appropriately employed were engaged in some type of teaching activity while more than 60% were participating in committees writing articles or passing on information in some other way. Two thirds of the appraised fellows made three or more different types of contribution to strengthening the health services of their country.

It may fairly be concluded therefore that the results of the fellowships have in the main been satisfactory and that the training given has generally been put to good use when the fellows returned to their own countries. As stated in *The First Ten Years of the World Health Organization*, Fellows bring back new ideas and techniques which they pass on to others in their countries. They introduce new methods in existing services and make them more effective. They establish health services new to their countries and they undertake research. Perhaps most important, a very high percentage of fellows are taking an active part in training programmes and thus passing on to others the benefits they have themselves received.

These results would not be possible however without the support and co-operation of Member States in selecting suitable candidates in accepting fellows for training and in providing the necessary facilities and opportunities for fellows on their return home. The Eleventh World Health Assembly after considering the Director General's report on the WHO fellowships programme adopted a resolution in which it thanked *all countries which have received WHO fellows and all public health officials, academic teachers and research workers who in institutions all over the world are giving of their time to the training of WHO fellows and without whose co-operation this large programme of international training and exchange of scientific information would not be possible*.

The Assembly expressed its satisfaction with the efforts made to keep fellowships under constant review and to develop simple methods of appraisal and invited the attention of all Member States to the need for further improvement in the planning of requests, the selection of candidates and the proper employment and full utilization of fellows on return.

## Notes and News

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Two impressions of WHO activities by independent writers

*Voyage chez les vivants* by Pierre Gascar  
Gallimard Paris 1958

*Doctors to the World* by Murray Morgan  
Viking Press New York 1958

To mark its Tenth Anniversary WHO invited two independent writers—one an American free lance author and journalist the other a French novelist—to observe different types of WHO activities under conditions and in countries of their own choice and to record their impressions. Apart from providing the facilities and the necessary

introductions the Organization took no part in the production of these two books.

*Voyage chez les vivants* by Pierre Gascar is not strictly speaking a guide to the work of the Organization nor even to the countries he traversed. It is however the log book of an unusual journey of exploration through the Philippines, Thailand, Indonesia, Malaya, India and northern Africa following in the track of the world's great diseases. Pierre Gascar—who was awarded the Prix Goncourt of 1953—set out with no more knowledge of medical and scientific practice than the ordinary cultivated layman. It is not his intention to give readers a superficial

education in the techniques used by the health workers he met indeed he has no hesitation in confessing more than once

Je perds le fil des explications " What he has to offer is the immediacy of his experience—the impact of some months' contemplation of human suffering in surroundings very different from his customary environment. The arbitrary interspersing of action observation and reflection imposed by the diary form he has chosen produces the fragmentary effect of real life. Like the medical teams he describes he is concerned simultaneously with the destiny of man and the whereabouts of the next ford.

Along the course of his arduous journey Gascar records the impressions he received from seeing at close quarters the victims of leprosy tuberculosis malaria yaws bilharziasis trachoma cholera plague small pox—and the ubiquitous poverty and malnutrition. Among his fine descriptions of scenes not often visualized by the inhabitants of more fortunate countries occur brief and vivid pictures of a small clinic or a solitary doctor battling—to Gascar almost vainly—against the tide of disease and lethargy surging in from the surrounding jungle desert or teeming eastern city. He appreciates only too clearly the obstacles to international health work posed by economic conditions social customs religions—even time and space and one may feel at times that he is almost too disheartened by the enormity of the task. He does however supplement his awareness of these problems with many penetrating observations on what is being done to overcome them. He is fascinated for example by the intricacies of collecting and disseminating epidemiological information by the absolutism of quarantine arrangements at the great ports of the East and by the ingenious methods developed to gather in for treatment the malarial nomads of Somalia or the "unouchable" tuberculosis of India without disrupting the pattern of their lives.

Sharing the daily routine of the health teams to whose work he pays sincere tribute he enters even more closely into the way of life of the people native to each country. In

original and striking terms he describes their appearance and condition and gives the feeling of their landscape—the misty pastel of Java the ochre coloured buffalo-trodden dust of the Indian plains the "inspired geology" of the Ethiopian mountains or the Philippine archipelago sliding at its lowest point below the waves. His book holds the attention by its personal autobiographical quality it is a day-by-day account of a journey not merely through some of the less hospitable quarters of the world but also towards a greater consciousness of the plight of many millions of human beings living there.

In *Doctors to the World* as the title reveals a very different approach is adopted. Murray Morgan is among those writers who have made a practice of immersing themselves temporarily in the concerns of some large project with the object of interpreting to the general public its aims and working methods. While Gascar identifies himself with the suffering peoples of the jungles and deserts he visits Murray Morgan is concerned with those who come to assist them: he names and describes many of the staff members he accompanies in their routine work: he reports through their eyes and often in their words. Gascar's book is a traveller's diary in the 19th-century literary tradition, filled with intensely personal reflections illustrated solely by maps of his journeys: an exploration partly of places and peoples partly of himself. Murray Morgan's is an objective survey like the tourist of today: he informs himself in advance of what is to be seen efficiently covers the ground and does not forget his camera. The writing of Gascar evokes a landscape of pain famine and solitude against which WHO's battle with disease is waged—his Poe-like vision of the malformations of leprosy and yaws is not easily dismissed from the mind. Murray Morgan's description of leprosy in half a dozen matter of fact lines is that of a reporter who observes not only the lesions of the disease (to which he characteristically refers in clinical terms taking his colour from the medical team with whom he is associating) but also the gay clothes and sociable prosaic manner of the



lepers This photographic method produces a comprehensive picture of how WHO staff are accomplishing specific tasks the target the difficulties and the proportional achievement are realistically appreciated whether the scene is the administrative complexities of Mexico's malaria eradication programme or a tiny ill equipped clinic improvised from a henhouse in the Andes

For each chapter he selects a health problem typical of one large area of his 28 000 mile journey through Central and South America and Central and West Africa concentrating perhaps on the more spectacular pursuits such as the hunting of rabies bearing vampire bats but nevertheless keeping fairly before the reader's eye the many other projects carried on simultaneously in the region The book covers in some detail campaigns against malaria kwashiorkor rabies yellow fever bilharziasis yaws and leprosy and sketches both public health education in the field and the epidemiological intelligence services of headquarters The fundamental difference between WHO's policy and that of other health missions is well illustrated—namely that the projects it undertakes are designed as far as possible on the spot within the framework of local conditions at the request of local authorities to be eventually bequeathed to local health workers who have often been recruited and trained by the international staff

The kind of story Murray Morgan tells will be familiar to anyone in or on the fringes of medical work Of particular value to the lay reader however is the abundant carefully digested factual information on clinical laboratory and field research aspects with which he supplements the lively anecdotes of his encounters He is able to infuse interest into a textbook account of the life cycle of schistosome flukes or a description of the routine procedures for egg passage of the influenza virus as successfully as he communicates his excitement on seeing the physical and moral transformation of a jaws crippled child cured by a single penicillin injection His style has the highly readable fluency which characterizes many American magazines even at its most extreme this style

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### People Like Maria

This recently released film was made for WHO by World Wide Pictures Ltd London to mark the tenth anniversary of the founding of the Organization and to show something of the way in which it is helping to promote international public health

As its title implies *People Like Maria* is a document of human interest it describes in three sequences how people in some of the less advanced areas of the world are becoming pioneers in the cause of health thanks largely to the assistance and training facilities offered by WHO and other international bodies

The first episode is the story of a young Bolivian nurse ("Maria" of the film's title) freshly graduated from a WHO training course whose task is to establish a maternal and child health centre in the wastes of the

Atiuplano—a wind swept plateau almost 14 000 feet high in the Bolivian Andes. Her brave and unflagging efforts to allay the suspicion and animosity of the local Indian population and her eventual success in winning their confidence and persuading them to take advantage of the services offered are depicted against a background of poverty, ignorance and desolation in one of the world's most inhospitable areas.

The second sequence relates an incident which occurred recently in Northern Nigeria. As part of the activities connected with a WHO malaria control project an area of some 300 square miles was sprayed with dieldrin in an effort to combat *Anopheles gambiae* infestation. After a time the number of mosquitos killed by the insecticide began to diminish and when the malariologists in charge applied tests for susceptibility to anophelines captured in the sprayed area they were disquieted to find that the tolerance of these mosquitos for dieldrin had risen eightfold. The impact of this discovery on the malaria workers concerned can readily be appreciated since never before had insecticide resistance been reported in African anophelines.

For the third and last episode the scene shifts to yet another part of the world—to a Burmese village where a young rural health worker has been sent after finishing his period of training at a school in Rangoon which was set up with the assistance of WHO shortly after the war. His initial timidity before the village elders gives place to self assurance as soon as he realizes that his advice and help on all sorts of health problems are so badly needed by the local population. One day during a tour of the area assigned to him he comes upon a mysteriously depopulated village. His bewilderment quickly changes to alarm when the discovery of a dead rat leads him to suspect quite rightly that an outbreak of plague has stricken down the villagers. Thanks to his speediness in informing the local health authorities the machinery of plague control is put into operation without delay and a probable major epidemic is averted.

*People Like Maria* runs for approximately 50 minutes and is available in three versions—English, French and Spanish. Inquiries regarding its distribution should be addressed to The Visual Media Officer, Division of Public Information, World Health Organization, Palais des Nations, Geneva, Switzerland.

### WHO in the service of international nursing

In commemoration of the tenth anniversary of WHO the April number of the *International Nursing Review*—the journal of the International Council of Nurses—contains a World Health Organization Symposium devoted mainly to the work that the Organization has been doing to strengthen nursing services throughout the world. Each of the six WHO regions is dealt with in a separate article. As one article points out "each country has its own unique health needs which must be considered when planning programmes" but it is clear that the basic problems facing the regional offices when they were set up were the same everywhere: a shortage of nurses and a low standard of nursing education. The position has improved greatly over the past ten years but in some areas—particularly in the Western Pacific and South East Asia Regions where the shortage of nurses was most acute—it will be necessary for WHO to continue to provide nurse tutors to assist in basic training for some time to come. In other more favourably placed regions, notably the European Region and the Region of the Americas, WHO assistance is being directed more towards the provision of post graduate training and refresher courses for nurses to equip them for nursing specialties and administrative posts. Attention is also being given to improving the status of the nurse in the community, encouraging professional self-determination and securing adequate representation for nurses on health administrations. In this way it is hoped to attract more young women to the nursing profession and to raise the standard of nursing education.

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and pamphlets on medical and public health subjects they nevertheless occupy a unique place because of their international character. A special effort is being made not only to render individual publications authoritative in the technical sense but also to make them as representative as possible in the aggregate of the various schools of thought in different countries. For those who might ask themselves: Is there in my particular sphere of interest any international study indicating the general trends of thought in other countries? WHO has prepared a bibliography of everything published by the Organization between 1947 and the end of 1957.

Almost 2000 items comprising technical, general and administrative articles and publications are serially numbered and

grouped in alphabetical order by subject the headings used being based upon those employed in the *Current List of Medical Literature* Washington D C and supplemented by author and country indexes. Most of the works thus catalogued are available—like the *Bibliography* itself—in both English and French while some also exist in the other official languages of the Organization—Chinese Russian or Spanish. To help the reader find his way in the selection of material of interest to him the principal features of each of the WHO publications are described in the Introduction and the checklist of titles in the various series will also be of use here. This volume demonstrates WHO's policy of preserving a closely systematized documentation of its programme and functions.

venereal diseases and treponematoses virus diseases zoonoses and veterinary public health and other communicable diseases international quarantine epidemiological and statistical services atomic energy in relation to health environmental sanitation nutrition mental health health services and medical care maternal and child health health education of the public education and training and nursing pharmaceutical standards and nomenclature biological standardization addiction producing drugs and health laboratory methods publications and reference services and public information

The narrative is supplemented by a series of annexes containing useful background information. They include the text of the Constitution a list of Members and Associate Members participants in the Technical Preparatory Committee and International Health Conference which prepared the way for the establishment of WHO membership of the Interim Commission and principal officers of the World Health Assembly and the Executive Board lists of expert advisory panels and committees technical meetings and non governmental organizations in official relations with WHO distribution of fellowships data on staff income and expenditure tables

The interest of the volume is enhanced by several maps and charts and 28 pages of photographs. These last include portraits of some of the personalities closely associated with the development of WHO as well as pictures of headquarters the regional offices and aspects of the Organization's work. There is also an index.

An exceptionally modest price has been fixed for this book in order to make it as widely available as possible.

*Ten Steps Forward World Health 1948-1958*  
by Ritchie Calder. Geneva 1958. 68 pages illustrated. Price 2s 6d \$0.50 or Sw fr 1.50. Also available in French and Spanish.

In this booklet for the general reader Ritchie Calder uses an ingenious device to

describe the progress of international health since WHO was founded ten years ago. For each year of the Organization's existence he has selected a story illustrating an aspect of WHO's work, being content simply to relate the facts and leave the reader to draw his own conclusions. As Dr M. G. Candau, Director General of WHO, states in a short epilogue these stories show the measure of success the Organization has achieved, the handicaps it has faced and the experience it has gained. There is no boasting of achievement because whatever we may have succeeded in doing is insignificant compared with what remains to be done. On the other hand we like to think that we have made a virtue even of our mistakes. Like the achievements they are the substance on which we build for the future.

The stories deal with the Egyptian cholera epidemic of 1947-48, the organization by a WHO sister tutor of training for nurses in Ethiopia, Borneo and Cambodia, the publication of the *Pharmacopoeia Internationalis*, the organization of maternal and child welfare services in South East Asia, antituberculosis work in under developed countries, steps to prevent protein malnutrition in children, the appearance of DDT resistance in mosquitos, the health hazards involved in the peaceful uses of atomic energy, the control of virus diseases, the use and abuse of drugs in mental health treatment.

The 24 pages of photographs complement rather than illustrate the text. They are arranged in a series of picture stories, each complete in itself, showing the treatment of yaws in Nigeria and leprosy in Burma, the world wide attack on malaria, the rehabilitation of poliomyelitis victims in Japan and the work of a Greek orphanage.

*Publications of the World Health Organization 1947-1957. A Bibliography.* Geneva 1958. 128 pages. Price 17s 6d \$3.25 or Sw fr 10.—Published in English and in French.

Although the publications of the World Health Organization represent a negligible proportion of the world's periodicals, books



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## NEUROTROPIC VIRUS DISEASES

Virus research has been proceeding at a great pace during the past ten years. The development of vaccines against poliomyelitis has been the most spectacular result of this work but other discoveries have been made which may prove in the long run to be no less important. Two large groups of viruses—the Cocksackie viruses and the ECHO viruses<sup>1</sup>—have been isolated from the human intestinal tract and many of them have been shown to cause diseases resembling "non paralytic poliomyelitis" for which the collective term "aseptic meningitis syndrome" has been proposed. These and other diseases caused by neurotropic viruses present a growing problem in Europe. The WHO Regional Office for Europe therefore decided to convene an Advisory Group to examine the present situation and make recommendations for the control of these diseases. The Group which met in Copenhagen from 14 to 19 April 1958 comprised experts from 14 countries.

### Reporting of cases

Many countries do not have reliable data on the incidence of neurotropic virus diseases and even in the case of poliomyelitis under reporting is general. From evidence recently accumulated it was concluded that the true incidence of paralytic poliomyelitis in some countries may be ten times as high as the reported incidence. For epidemiological purposes a break-down by age groups, geographical distribution and type of poliovirus is essential.

It was also pointed out that each year a new group of cases of permanent paralysis is added to the large residue from previous epidemics so that the medical, social and economic consequences are cumulative. The Group recommended that studies should be made to evaluate this cumulative effect in

order to obtain a better picture of the true importance of poliomyelitis. They also agreed with the recommendations contained in the second report of the Expert Committee on Poliomyelitis<sup>2</sup> to the effect that only cases with paralysis as defined in the report should be reported as poliomyelitis and that the term "non paralytic poliomyelitis" should be replaced by "aseptic meningitis syndrome" qualified by specification of the etiological agent where known.<sup>3</sup>

### Poliomyelitis vaccination

In view of the known periodicity of poliomyelitis epidemics the Group felt that it was still too early to assess the true significance of the drop in the incidence of poliomyelitis that had followed large scale vaccination campaigns in some countries. At the same time it was agreed that the results so far were sufficiently encouraging to justify introducing or continuing these measures in countries where poliomyelitis is of significant public health importance. Before embarking on an expensive vaccination programme however precise epidemiological information should be available and public health authorities should weigh the cost and the results likely to be achieved against other demands on their resources.

The Group considered that there were distinct advantages in establishing a national laboratory for the production of poliomyelitis vaccine but pointed out that this required a scientific staff with skill and long experience. The initial cost of establishing a laboratory is therefore likely to be high. On the other hand some countries had found it more economical to manufacture the vaccine locally than to import it and once the facilities had been provided they could perhaps be used later for the production of

<sup>1</sup> Enteric cytopathogenic human orphan viruses

WHO Hk A Org. tech. R. Ser. 19: 8, 145  
See also Chron. WHO Hk A Org. 19: 8, 12, 147



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PRINTED IN SWITZERLAND

## ECHO and Coxsackie viruses

Recent observations suggest that the ECHO group of viruses is playing an increasing role in causing epidemics of aseptic meningitis. Up to the present 20 serological types have been identified. The significance of the various types as etiological agents has not yet been thoroughly elucidated but most of the well defined epidemics were due to type 9 and a few to types 4 and 6. Many types have been isolated only from healthy persons. On the other hand ECHO viruses have been found in some paralytic patients from whom no poliomyelitis virus could be isolated.

The Coxsackie group of viruses appears to be capable of causing quite a number of diseases including herpangina, aseptic meningitis, pleurodynia (Bornholm disease) and infantile myocarditis as well as some forms of febrile pharyngeal or gastro intestinal disease. Though it is difficult to assess the public health importance of these diseases, some of the epidemics that have occurred have caused considerable inconvenience and loss of man hours.

The Group suggested that WHO might study the possibilities for the production and exchange of sera and type strains among national public health laboratories as specific type diagnosis is very important from an epidemiological point of view.

## Tick borne encephalitis

This disease has now been reported from Austria, Bulgaria, Czechoslovakia, Finland, Germany, Great Britain, Hungary, Poland, Sweden, the USSR and Yugoslavia. In some of the eastern countries an incidence of up to 3 per 100 000 has been reported with a lethality as high as 25%. In the endemic areas of Europe the incidence may exceed 10 per 100 000 in some years but the disease is much less lethal and paralysis is rare. The incidence depends mainly upon the possibilities of contact between the population and infected ticks, although big local outbreaks have also been caused by the consumption of raw milk from infected goats.

Tick borne encephalitis can be diagnosed either by complement fixation tests or by virus neutralization tests. The complement fixation test remains positive only for a limited period after infection whereas the neutralization test still gives a positive reaction after several years. All strains of virus isolated from tick borne encephalitis have shown a close antigenic relationship with one another and also with the virus of louping ill in sheep. The Group felt it desirable that studies should be continued on the antigenic relationship between strains of tick borne encephalitis isolated in various countries and it suggested that WHO should arrange for the establishment of one or more international standard sera for use in virus neutralization tests for measuring the potency of therapeutic sera and possibly for use in complement fixation tests.

Anti tick campaigns have been carried out in some areas as a means of controlling the disease. Prophylactic immunization with formalized mouse brain vaccine has also been used successfully especially in the USSR. The Group strongly recommended that laboratory personnel should be vaccinated as many infections have been acquired during work on tick borne encephalitis virus. The possibility of using less pathogenic strains for routine laboratory studies should also be examined and work on improving methods of vaccine production should be continued.

## Other neurotropic viruses

Although the terms of reference of the Advisory Group were limited to enteroviruses and the virus of tick borne encephalitis, certain other viruses which may cause aseptic meningitis or even encephalitis were also discussed briefly. Mumps virus is a frequent cause of aseptic meningitis in Europe and lymphocytic choriomeningitis is endemic in some areas where contact with infected rodents is common. Herpes virus is a rare cause of aseptic meningitis and in some countries leptospira are often associated with this disease. Encephalomyocarditis is not considered to be of any importance in Europe.

other virus vaccines such as influenza mumps adenovirus ECHO virus and perhaps measles

Of the various methods of production of poliomyelitis vaccine at present in use no one method could be singled out as preferential and further studies are needed. Particular attention should be given to the question of preventing losses among the monkeys. It is not rare for losses of up to 60% to occur. Another serious problem is the risk of animal attendants becoming infected with monkey pathogens especially tuberculosis and B virus. Nearly all infections with the latter have proved fatal. It was suggested that the data obtained in studies on these problems should be circulated to all laboratories working in this field.

Although there have been very few accidents following the use of poliomyelitis vaccines small errors in the application of safety measures can have much more serious consequences than similar errors in the production of other vaccines. It was noted that the Expert Committee on Biological Standardization had made proposals regarding the establishment of international reference sera and an international reference vaccine<sup>4</sup> and that WHO would shortly be convening a Study Group on Recommended Requirements for Poliomyelitis Vaccine<sup>5</sup>. The suggestion was made that an internationally recognized testing laboratory would facilitate international traffic in poliomyelitis vaccine by obviating the need for countries to retest imported vaccine and could also provide assistance to laboratories experiencing production difficulties. Serious and unpredictable difficulties have been encountered from time to time by almost all laboratories undertaking large scale production and the possibility of delays must be taken into account when planning vaccination programmes.

#### Live poliovirus vaccines

Some studies which have been made with live vaccines have given very promising

results but there is not yet sufficient information available to permit the use of these vaccines in public health programmes. It is known that orally administered vaccine virus is excreted in the stools and all the strains so far tested have shown a tendency to revert to increased intraspinal or intracerebral activity in monkeys after human passage. It is not yet established however what this change means in terms of the danger of infection of the nervous system in humans after oral administration. The Group suggested four ways in which this problem might be approached.

- 1 The natural circulation of attenuated virus among humans could be studied in relatively isolated communities or in children in institutions. This would eliminate intermediate laboratory procedures and the extent of reversion to intracerebral pathogenicity for the monkey on natural human passage could be determined.

- 2 The vaccine virus could be passed serially through humans who had previously been successfully immunized with potent inactivated virus. In this way any increase in virulence of the live vaccine could be safely observed.

- 3 The stability of the strain could be tested by passage in tissue culture or in laboratory animals. Any increase in intracerebral pathogenicity would suggest that the strain was unstable and not suitable for large scale use in man.

- 4 The value of monkey pathogenicity tests as an aid to the selection of live virus vaccine strains might be checked by making a systematic study of the monkey virulence of strains isolated from paralytic cases.

Although it is not possible at the present time to indicate a preference for any particular strain for field study there appears to be some evidence that strains which grow best in alkaline tissue-culture media show a lower intracerebral activity in the monkey than those growing equally well in more acid media. It would therefore be advisable to concentrate on the use of such strains.

## UNTOWARD REACTIONS TO PENICILLIN

*World production of penicillin is now sufficient to provide more than 250 million courses of treatment annually. Against the staggering total the number of severe reactions reported is disproportionately small. Yet it is important that all users of penicillin should be fully aware of the reactions that may occur and of the precautions that should be taken to keep the risks to a minimum. With this aim of protecting public health authorities should have a readily accessible body of data on which to base their policies. WHO has undertaken a study of these questions: the first results of this form the subject of this article.*

"Penicillin is the queen of drugs. It is the most satisfactory weapon known in that it does its particular task with utmost efficiency and negligible harm." This opinion was expressed in 1954 in an American textbook of pharmacology.<sup>1</sup> Can it still be upheld in view of the increasing number of severe and fatal reactions reported in the medical literature? The answer is of vital importance to public health programmes for penicillin has undoubtedly become the key drug in the control of a wide range of communicable diseases. WHO has a special interest in this question for the campaigns against treponematoses which it is sponsoring and which involve millions of people in many parts of the world would be impossible without penicillin. In December 1956 a questionnaire on the incidence of penicillin reactions was sent to members of the WHO Advisory Panel on Venereal Diseases and Treponematoses and earlier this year an analysis of the answers was published in the WHO Bulletin.<sup>2</sup> The same number of the Bulletin also contained a report on penicillin sensitivity reactions in Taiwan. Following up these studies a comprehensive review of the literature has now been undertaken by T. Guthe, O. Idsøe and R. R. Willcox.

It is on this review that the following discussion is mainly based.

### The picture in outline

Penicillin came into general use in 1943 but the first death from penicillin therapy was not reported until 1946 and another three years elapsed before a second fatality occurred. During the past ten years however severe reactions have been reported with increasing frequency and the number of fatal cases has multiplied rapidly. By 1955 some 560 anaphylactic reactions had been reported, 81 of them fatal and by 1957 it was estimated that some 1000 deaths from anaphylaxis due to penicillin had occurred in the United States of America alone. To obtain a true picture however these figures must be set beside the phenomenal increase in the consumption of penicillin that has taken place during the past 15 years. In 1943 the first year of commercial production in the United States of America only 29 pounds of crude penicillin were produced whereas by 1955 the world production of penicillin exceeded 500 tons a year—enough to provide 250 million courses of treatment of 3 million units each.

The increasing frequency with which reactions have been reported in recent years is thus seen to be largely a natural consequence of the vast scale on which penicillin is now being used. Indeed it is the general absence

<sup>1</sup> Dill, V. A. (1954) *Pharmacology in medical practice*. 3rd ed. New York.

<sup>2</sup> Willcox, R. R. (1957) *Bull. W.H.O.* 15, 457.

Idsøe, O. & Wang, K. Y. (1957) *Bull. W.H.O.* 15, 323.

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There have been reports from Czechoslovakia of infection in man and animals with equine encephalitis virus. In view of the epidemiological importance of these findings it was recommended that further research should be carried out to confirm the presence of these viruses in Europe.

#### Laboratory diagnosis of neurotropic virus diseases

The Group recognized that specific laboratory diagnosis of virus diseases is often of little help to the individual patient but emphasized that it is nevertheless important for public health authorities to be informed of the prevalent etiological agents so that they can adopt appropriate prophylactic measures. Such information is also required in connexion with epidemiological surveys and it enables communicable diseases to be reported more accurately. Furthermore virus diagnostic laboratories can help in evaluating the effect of specific control measures such as vaccination. In general the laboratories should be in close relationship both to the public health laboratory services of which they may be a part and to the major treatment centres for infectious diseases. But in view of the

complicated facilities and specialized personnel required it is advisable to have relatively few laboratories located in the big population centres rather than a large number of small laboratories scattered throughout the country.

For the diagnosis of infections with enteroviruses serological tests alone have been found unsatisfactory. It is therefore necessary to have equipment for tissue culture work and a satisfactory supply of experimental animals so that the virus can be isolated and identified. Serological tests have been found of considerable value however for the diagnosis of other virus infections such as mumps, tick-borne encephalitis and lymphocytic choriomeningitis.

During recent years rapid advances have been made in laboratory techniques and a number of viruses responsible for diseases of the central nervous system have been identified. Nevertheless the Group stressed the fact that the etiology of a considerable proportion of cases is still unknown and it can be anticipated that the ecological changes associated with the continual rise in living standards may result in the appearance of yet other diseases due to neurotropic viruses.

#### *Arrangements for vaccination against yellow fever*

The International Sanitary Regulations specify that an international certificate of vaccination against yellow fever is valid only if the vaccine used has been approved by the World Health Organization and if the vaccinating centre has been designated by the health administration for the territory in which it is situated.

A supplement to a recent number of the *WHO Weekly Epidemiological Record* (No. 25, 1958, Supp. 3) reviews arrangements for vaccination against yellow fever in some 120 countries and territories as on 20 June 1958, listing designated vaccinating centres and institutes manufacturing yellow fever vaccines approved by WHO.

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cillin causes meningeal irritation and serious complications have been reported but this route of administration is seldom used today. It seems justifiable to conclude that "the toxic effects of penicillin in man are in the broad run of events negligible. They certainly have detracted little from the use and usefulness of penicillin in clinical practice and public health programmes."

### Allergic skin reactions

As already mentioned allergic reactions differ from true toxic reactions in that they are not inherent in the pharmacological nature of the drug but are due to a hypersensitivity or altered reactivity of the patient usually the result of previous exposure to the drug or a related substance. Moreover the severity of such reactions is independent of the quantity of drug administered and they can be produced even by minute doses.

It seems that penicillin can evoke the production of two types of antibody: a skin sensitizing antibody and an antibody responsible for anaphylactic reactions. The skin sensitizing antibodies may produce either an eczematous reaction or an urticarial response. The most frequent form of eczema is contact dermatitis caused by local application of penicillin in the form of ointment or solution or by prolonged handling of the drug as in doctors and nurses. Estimates of the frequency of contact dermatitis vary from 4% to 10% of persons exposed to contact with the drug over long periods. It is therefore advisable to avoid local applications of penicillin wherever possible and in any case not to continue treatment for more than three to five days. Desensitization is sometimes of value for doctors and nurses.

Another form of eczema can be caused by parenteral administration of penicillin or by its inhalation. The eruptions are of the erythematovesicular type resembling those caused by fungal infections (trichophytosis and epidermophytosis) and are characteristically localized to the groins, the interdigital spaces and the palms and soles. It has been suggested that a previous fungus infection may result in cross sensitivity to penicillin.

as it appears that such reactions may occur in persons not previously exposed to the drug.

Both types of eczematous reaction usually subside rapidly when penicillin is stopped and appropriate treatment given. Topical application of hydro-cortisone may be of value in prolonged cases. It is rare for generalized eruptions or exfoliative dermatitis to develop. If they do they are generally of a mild type although serious complications such as anuria have been reported and exfoliative dermatitis may occasionally become haemorrhagic and gangrenous.

"Serum sickness like penicillin reactions" is a collective term which has been proposed to describe a group of allergic reactions comprising urticaria, angioneurotic oedema, joint pains, inflammation of the lymph glands, fever and other manifestations similar to those seen in serum sickness. Such reactions usually follow injections of penicillin but can also occur after other forms of administration. They may appear within 30 minutes or only after several weeks. With modern preparations of penicillin, such as PAM, it has been estimated that serum sickness like reactions occur in 12% of all patients receiving the drug. Children appear to be less likely to develop such reactions than adults. Serum sickness like reactions are not usually dangerous but very rarely severe and even fatal complications may develop such as laryngeal oedema, periarteritis nodosa, purpuric lesions or cardiovascular collapse. ACTH or cortisone may be life saving in such cases. Mild reactions usually subside spontaneously within a few days or weeks when penicillin treatment is stopped. The antihistamines may be effective in severe or prolonged cases but are of no value prophylactically although an antihistamine penicillin salt recently introduced has been claimed to obviate allergic reactions in persons sensitive to penicillin. The use of the enzyme penicillinase in cases of urticaria and angioneurotic oedema resistant to other methods is another recent development that has given promising results.

All forms of skin sensitivity to penicillin are usually transient, declining gradually



of untoward reactions that has encouraged such lavish use of penicillin. Unfortunately it has also encouraged its indiscriminate use. Penicillin has been widely prescribed for all kinds of minor infections and for conditions in which it is ineffective or not more effective than other drugs and since it can be bought without prescription self medication is common. Severe reactions occur only in patients sensitized by previous exposure to the drug and it is known that many of the fatalities that have occurred following the legitimate use of penicillin have been attributable to previous unnecessary medication. Naturally the chances of a patient having had previous treatment with penicillin are today much greater than they were 10 or 15 years ago.

These are the main features of the present situation. In order to analyse it further it is necessary to examine in some detail the nature of the reactions that may result from penicillin administration.

### Types of reaction to penicillin

In common with most other drugs penicillin can produce various types of untoward reaction. These are often referred to collectively as toxic reactions but strictly speaking this term should be reserved for quantitative pharmacological effects experienced by every person receiving a sufficiently large dose of the drug i.e. for effects which are inherent in the nature of the substance and the severity of which is a function of the dose.

Most modern chemotherapeutic agents have a low toxicity in relation to the therapeutic dose and penicillin is an outstanding example of this. But these drugs can produce reactions of a different kind by virtue of the fact that they are potential antigens: repeated administration may produce sensitization in the patient leading to allergic skin reactions or anaphylactic shock. The majority of the reactions to antibiotics in general and to penicillin in particular are produced by this mechanism.

Antibacterial drugs can also produce undesirable reactions by interference with the metabolism of the microbial flora. Thus

can result in superinfection and cross infection by organisms less affected by the drug than others or in a temporary exacerbation of symptoms due to the release of noxious substances following microbial lysis. A more serious problem is the development of resistance in the organism against which the drug is being used.

### Local and systemic toxic reactions

On the whole local toxicity to penicillin has not presented an appreciable problem. The early amorphous preparations of penicillin sometimes produced thrombophlebitis when given intravenously or pain and cellulitis on intramuscular or subcutaneous administration and penicillin in oil became used between 1945 and 1948 often caused local reactions of an allergic nature. Since the introduction of procaine penicillin with aluminium monostearate (PAM) however local reactions have virtually ceased. The more recently introduced benzathine penicillin—a particularly long acting preparation—was at first found to cause pain on injection but improved preparations have largely overcome this difficulty.

The acute toxicity of the various penicillin salts in animals is very low. Mild systemic toxic reactions were sometimes experienced with the early preparations owing to the presence of impurities but such reactions are practically unknown with the highly purified preparations now in use. It has been calculated that for a 70 kg man the LD<sub>50</sub> of sodium penicillin would be more than 150 million units—a dose far in excess of what it would be practical to give. There have been isolated reports of damage to the central nervous system, peripheral neuritis and transient psychosis following intramuscular injection. The pathogenesis of these reactions is unclear however and it is by no means certain that they are true toxic reactions. In any event they are exceedingly rare. In contrast to the sulfonamides and many other drugs penicillin does not cause damage to the bone marrow or haemopoietic system and it can be safely given in severe anaemia. Intrathecal administration of peni-

The type of penicillin preparation used does not appear to be important. Skin tests indicate that the common penicillin preparations are immunologically equivalent and this is supported by clinical experience. Although most of the reactions reported have occurred with procaine penicillin preparations this merely reflects the fact that it is this type of preparation which is generally used. Many authors have stated that procaine is unlikely to induce sensitivity and in two cases in which aqueous penicillin was substituted because of suspected sensitivity to the procaine component the patients died.

It seems then that the way in which a sensitized person will react to a subsequent exposure to penicillin is dependent largely on personal constitutional factors. Little is known as yet about the nature of these personal factors. The reactions occur most commonly in adults between 20 and 49 years of age but they appear to be equally distributed between the two sexes. They are rare in children under 12 years old and the frequency decreases rapidly with increasing age after 50. Children treated with penicillin are of course less likely to have had a previous exposure to the drug than older persons but there is also some evidence that they are less easily sensitized. In the older age-groups the consumption of penicillin is presumably lower than in younger adults but it may also be that desensitization takes place in the course of time.

It does seem well established however that patients with a personal or family history of allergy are more easily sensitized than others and that they react more severely to subsequent treatment. Great caution should therefore be observed if re-treatment with penicillin is indicated in such patients.

#### Changes in the microbial flora

Of the various changes in the microbial flora brought about by the administration of penicillin the one which has caused most concern so far is the development of resistance in staphylococci. Some organisms such as

*Escherichia coli* show a natural resistance to penicillin but acquired resistance has not presented a problem as yet in other than staphylococcal infections. In some studies 50-70% of hospital patients have been found to carry antibiotic resistant staphylococci the type of resistance depending upon the antibiotic in current favour. Cases of complete resistance to all antibiotics have been reported. Resistant staphylococci can cause superinfection in a patient being treated with the antibiotic or cross infection in other patients in the same ward. The main problem has been created by staphylococcal pneumonias and urinary and wound infections. Staphylococcal enteritis may sometimes occur as the result of superinfection of the bowel with penicillin resistant organisms from the mouth or throat but this complication is more common with orally administered antibiotics such as the tetracyclines.

The resistant organisms are spread by dust from clothing and bedclothes or by hospital personnel who acquire resistant strains from penicillin treated patients. It has been shown that the proportion of nasal carriers among student nurses entering hospital may increase in one month from around 5% to as much as 50%. Precautions which should be taken in hospital to prevent cross infection include such measures as isolation of staphylococcal cases and carriers, barrier nursing and the wearing of masks by hospital staff. The development of resistant strains can be minimized by restricting the use of penicillin—and, indeed, of all antibiotics—to cases where they are absolutely necessary and by giving sufficiently large doses at the beginning of treatment to kill the organisms rapidly.

Fortunately the acquired resistance of the staphylococci is usually lost again fairly rapidly when they are diluted with non-resistant strains in the general population, and outside hospital resistance has so far not been encountered on a serious scale. It has recently been reported however that the percentage of nasal carriers of staphylococci among blood donors in Australia was twice as high in 1955 as in 1954 and the situation must therefore be watched carefully.

over a period of 6 12 months Nevertheless treatment with penicillin should be avoided if possible in patients with a past history of skin reactions since the symptoms may recur and the possibility of systemic rather than skin sensitization has to be kept in mind

### Anaphylactic reactions

As already indicated allergic skin reactions to penicillin rarely constitute a danger to life most of the fatalities that have been reported have been due to reactions of the anaphylactic type Since such reactions are only known to occur in persons sensitized by previous exposure to the antibiotic they were exceedingly rare during the first few years of penicillin therapy

It is difficult to make an accurate assessment of the frequency with which anaphylactic reactions occur as only a small proportion of them are reported in the literature even if they end fatally The greatest number of reports comes from the United States of America which consumes about three fifths of the total world production of penicillin and a survey described by Welch et al in 1957<sup>5</sup> throws some light on the frequency of anaphylactic reactions in that country In the 827 hospitals covered by the survey there were 2500 penicillin reactions during the three years 1954-56 Of these about 793 were of the anaphylactic type and 72 were fatal Since the three year survey covered one third of the hospitals in the United States these figures can be considered to correspond to the annual rates for the whole country During the same period about 200 tons of penicillin a year were used for human medicine in the United States This is enough to provide some 300 million injections so that there were about 25 anaphylactic reactions and 23 deaths for every 10 million injections given An estimate for Denmark based on statistics for the years 1951-55 also arrived at a figure of 3 deaths per 10 million injections The importance of previous exposure to

penicillin is exemplified by the fact that in the mass campaigns against the treponematoses among populations not previously exposed to penicillin several million people have received penicillin injections without any phylactic reactions having been reported On the other hand in Taiwan where the consumption of penicillin is very heavy (nearly 500 000 units per person per year) there were 74 anaphylactic reactions including 12 deaths between 1951 and 1955 For the same reason anaphylactic reactions are more common in urban than in rural areas Occasionally a negative history of previous penicillin administration is obtained but this can be misleading as local applications inhalations etc are not always remembered Serious and even fatal reactions have repeatedly been reported in patients who have previously used penicillin tablets lozenges spray antral instillations and ointment Exceedingly small quantities of penicillin seem capable of causing sensitization in susceptible persons In one of the fatal cases reported from Taiwan sensitization appeared to have been induced by a single tablet of 50 000 units taken one year previously Most of the patients however had previously been exposed to amounts between 0.6 and 4.8 mega units

The time interval between the administration of penicillin causing the anaphylactic reaction and the last previous administration can vary widely Intervals as short as ten days and as long as eight years have been reported The length of the interval does not appear to bear any constant relation to the severity of the reaction which probably depends more on individual factors It should be noted that in a sensitized patient the first subsequent administration of penicillin will bring on a reaction Consequently if a patient is given penicillin and no reaction occurs it can be assumed that further administrations in the same series will be without danger provided that the intervals between the doses are not longer than four days From this it follows that short courses of treatment with high single doses are preferable to longer courses with smaller doses

Welch, H. et al. (1957) *A. M. J.* 4: 800

should also be given and aminophyllin has been recommended by some authors in cases of respiratory distress. These drugs together with the appropriate syringes should always be carried by a doctor giving injections of penicillin. In clinics oxygen should also be available as well as a drip-infusion set continuous drip-infusion of 1 arterenol or plasma has been recommended in cases of prolonged depression of the blood pressure. Intravenous cortisone or intramuscular ACTH is also indicated in protracted cases. Recently it has been shown that penicillinase an enzyme that inactivates penicillin is capable of clearing the circulating antibodies from the blood. Given simultaneously 5000 units will completely inactivate 100 000 units of crystalline penicillin. This enzyme may prove of great value in the future for arresting anaphylactic shock. The recommended dose is 800 000 units intravenously followed by 800 000 units intramuscularly.

### Conclusions

From the data at present available it may be concluded that the inherent toxicity of penicillin is so low as to be of negligible importance but that discretion in its use is called for on two grounds allergic or anaphylactic reactions may occur in previously sensitized persons and there is a risk of superinfection or cross infection with penicillin resistant organisms especially staphylococci. The increasing frequency of untoward reactions to penicillin is attributable to the increasing use of the drug and especially to its uncontrolled indiscriminate use. Since sensitivity reactions almost always occur in patients previously exposed to the drug it should not be given for minor ailments or for diseases in which its efficacy is doubtful or not superior to that of other drugs. If it is reserved for cases in which its use is fully justified the chances of repeated exposures will be reduced to a minimum. Courses should be kept as short as possible by giving high doses. This will also help to diminish

the likelihood of creating resistant strains. The risks of cross infection in hospital can be minimized by suitable hygienic measures.

Another fact that emerges clearly from this survey is that although minor allergic reactions may occur in up to 12% of patients receiving penicillin severe anaphylactic reactions are exceedingly rare in comparison with the enormous quantities of penicillin used. It has been estimated that there are probably not more than 25 such reactions for every 10 million injections given and that only about three of these prove fatal. Moreover it is interesting to note that of the 12 fatalities reported from Taiwan 10 were in patients treated by private practitioners and the other two deaths occurred after penicillin injections given in a drug store and by a herb doctor. Only one reaction was reported from a hospital. There is reason to believe therefore that severe reactions are much less likely to occur if proper precautions are observed.

Finally the reactions that penicillin may cause must be set against the great powers which it possesses for the control of communicable diseases. When the entire picture is viewed in perspective it is seen that penicillin does indeed do its task "with the utmost efficiency and negligible harm" and that there is ample justification for continuing to regard penicillin as "the queen of drugs." But not unlike many queens of the past she may retaliate on those who do not respect her powers. There is need for education of doctors, nurses and the general public concerning the proper use of penicillin and the risk of sensitization and the sale of penicillin should be restricted by the introduction of regulations regarding prescription. In mass campaigns similar tactics should be adopted to those employed to overcome the problem of insecticide resistance in the control of insect borne diseases the work should be intensified so that the value of penicillin can be exploited to the full before or in case sensitivity or microbial resistance makes its appearance.

Among organisms other than staphylococci which may cause superinfection during penicillin therapy as a result either of resistance or of decreased competition mention may be made of *Escherichia coli* and of paracolon and proteus bacilli. Overgrowth with *Candida albicans* is more common after the orally administered tetracycline antibiotics than after parenterally administered penicillin but cases of moniliasis have been reported usually in the mouth. It has been suggested that the broad spectrum approach in which penicillin is combined with other antibiotics may actually increase the risk of superinfection by all types of organism.

In the treatment of syphilis with penicillin a Herxheimer type of reaction frequently occurs. This phenomenon also known as therapeutic shock is generally attributed to the release of noxious substances by the spirochaetes killed by the drug. In early acquired syphilis it occurs in 80-90% of patients. The reaction is usually mild in such cases and there is no need to discontinue therapy but severe and even fatal reactions may occur in late neurosyphilis, cardiovascular syphilis and gummatous syphilis as well as in debilitated babies.

Like other antibiotics penicillin may sometimes cause deficiency syndromes due to disturbance of the metabolic processes in the gastro-intestinal tract and interference with the production of the vitamin B complex and vitamin K. It is believed that the symptoms which include black tongue and lesions of the oral mucosae are due in part to an overgrowth of pathogenic flora.

### Precautionary measures

The frequency of severe reactions to penicillin can be greatly reduced by taking a number of simple precautions and it should be possible to eliminate fatalities almost entirely if the physician giving the injection always has at hand the necessary drugs to deal with an emergency. Before administering penicillin the patient should be questioned carefully regarding previous exposure to the drug and any manifestations of an allergic diathesis in himself or his family. Full details

of previous treatment should be noted and if a reaction occurred renewed treatment with penicillin should be regarded as contra-indicated. Even mild reactions such as itching, a tingling feeling in the tongue or fingers, a peculiar taste in the mouth, dizziness or slight fever should be taken as an indication of the probable presence of anaphylactic sensitivity precluding re-exposure to any type of penicillin preparation. An exception is the delayed type of serum sickness like reaction which does not appear to be a usual precursor of anaphylaxis.

There is clear evidence that patients with a history of asthma, hay fever, rhinitis or other allergic diseases react more easily and more severely than others. Bronchial asthma in particular appears to increase considerably the risk of severe anaphylactic reactions in penicillin sensitized patients and an asthmatic patient should not be treated with penicillin if this can possibly be avoided. As an additional precaution a skin test can be performed but patch tests appear to be of little value except in contact dermatitis. On the other hand the immediate intradermal test although usually positive in cases of anaphylaxis may itself produce a severe anaphylactic reaction. Moreover a negative test does not necessarily exclude penicillin sensitivity. Routine skin testing is probably not a practical procedure for all patients but might be considered before treatment of persons who routinely handle penicillin.

Penicillin should be injected slowly by the intramuscular route and the patient watched carefully during the injection for any signs of a reaction. Some authors favour giving the injection in one of the upper arms rather than in the buttock so that a tourniquet can be applied if a reaction commences but the efficacy of this procedure is doubtful. If possible the patient should be allowed to remain in the consulting room for about 15 minutes after the injection. Adrenaline (1:1000) should be to hand for immediate injection if anaphylactic symptoms appear. If subcutaneous injection is ineffective it may be given intravenously or even directly into the heart. An antihistamine such as diphenhydramine hydrochloride or tripeleminamine

Chartered Society of Physiotherapy arranged an itinerary. These two former trainees are now serving as Superintendent and Assistant Superintendent of the combined school and treatment centre.

The students of both sexes were nearly all university graduates (inter science). They proved to be quick to assimilate the new knowledge and able to use their initiative, an important consideration in a country where ready made equipment is not always available. The Indian Government was anxious that the school should take students from all parts of India and the first groups included Mahratti, Gujarati, Sindhi, Goan, Parsee, Malayalee, Punjabi, Moslem and Thai. Owing to economic and other difficulties, however, later groups included a disproportionate number of students from Bombay City and there is a risk that this area will become overloaded with physiotherapists. Hospital employment was found for most of the students while others worked for doctors or went into private practice.

### The clinic

From 30 patients a day the patient load at the clinic steadily increased until at times it reached 300 a day. A wide variety of conditions were seen, from leucoderma to leprosy and from spinal caries to venereal disease. Many patients with fractured femurs came with badly everted limbs and drop-foot with pes cavus. A large supply of sandbags was ordered and splints made for use in the wards. As a result of these measures and the co-operation of the students and nurses, these contractures and deformities had practically disappeared after three years.

The wards also contained many paraplegics, slowly dying of massive bedsores and bladder infections. Most of these patients

adopted a fatalistic attitude to their disease, believing that it was their Karma, a punishment for misdeeds in former lives. But once they saw that an interest was being taken in their condition and experienced some of the benefits of modern treatment, they regained hope and became co-operative. With perseverance it was eventually possible to get most of them upright between bars.

The circumstances often called for the use of unorthodox methods, sometimes with surprisingly good results. The most striking were perhaps in long standing paralysis following poliomyelitis. The methods used included heat treatment, massage, interrupted galvanism, exercises and short courses of massive faradic stimulation. Treatment often had to be continued for several months before any improvement was seen, but good results were ultimately obtained in patients who could be persuaded to persist long enough. Sudeck's atrophy was successfully treated with paraffin wax and exposure to a heat lamp with constant movement of the phalanges for 30-40 minutes three times weekly. Crushed hands responded well to the use of paraffin wax, modelling clay, marbles and sponge rubber.

Once the department was running smoothly along these lines, the question of extending facilities for rehabilitation arose. In response to a request from the Indian Government, an international rehabilitation team, sponsored by the UN Technical Assistance Administration in New York and the World Veterans Federation, was despatched to India. Based on the King Edward VII Memorial Hospital, the team serves all State and municipal hospitals in Bombay City. By the time the team arrived, some three years after the start of the project, the physiotherapy school was operating independently and was no longer in need of the direct help of the WHO experts, but the work they started continues to bear fruit.

## THE FIRST PHYSIOTHERAPY SCHOOL IN SOUTH EAST ASIA

One of the ways in which WHO assists governments in strengthening health services is by the provision of specialists to organize the setting up of new teaching centres and to train the first students. With the increasing emphasis that is being placed on the rehabilitation of the patient many governmental health administrations are anxious to add physiotherapy departments to their hospitals and to make provision for the training of sufficient numbers of physiotherapists. Following the severe epidemic of poliomyelitis in India in 1948 the Indian Government requested WHO to send a team to Bombay to investigate the situation and to make recommendations for founding an All India School of Physiotherapy.

It was decided that the school should be attached to the municipal King Edward VII Memorial Hospital at Parel a suburb of Bombay and should include a treatment centre. The Government of India the Government of Bombay and the municipality of Bombay undertook joint responsibility for the school—the first of its kind in South East Asia—and WHO agreed to send two experienced physiotherapists Mr R Jacques and Mrs Page Coleman Mehta to do the initial spade work. The following account of the first years of the school and treatment centre is based on an article by Mr Jacques published in the April number of *Physiotherapy*.<sup>1</sup>

### Space and equipment

One of the main problems that had to be solved when the project was started in October 1952 was to find accommodation for the school and treatment centre and a minimum of equipment. Some physical therapy was already being given at the hospital but the department consisted

of one small room equipped only with two heat lamps and a primitive paraffin wax bath. In three years a greatly enlarged and well equipped department was built up including a treatment room a small school room a wax room and a store room. To make this expansion possible a gynaecology ward was evacuated and handed over and later when the number of patients increased to 100 a day an adjacent store room was converted into a gymnasium where up to 50 patients could exercise at a time. The X ray department handed over two short wave diathermy machines a combined table and two ultra violet standard lamps Couches gravity tables and many other pieces of equipment were made to specification. Although treatment was free the donations helped to pay for additional equipment including calipers crutches and urinals for paraplegic patients. Equipment to the value of £3500 was made available by WHO.

### The school

In June 1953 the first eleven students began a two years course of study and practice. The professorial staff of the Seth GS Medical College associated with the hospital undertook to teach anatomy physiology and dissection while training in neurology and psychology orthopaedics reading of X rays and gynaecology was given in the second year by honorary lecturers. The WHO specialists taught massage graduated exercises manual and electrical muscle testing electrotherapy of specific conditions and other techniques of physiotherapy. Examinations were held monthly at the end of term and at the end of each year. Diplomas were granted to successful students. At the end of the first course the two best students were sent to England for a six months finishing course and the

<sup>1</sup> The official journal of the Chartered Society of Physiotherapy of Great Britain.

Chartered Society of Physiotherapy arranged an itinerary. These two former trainees are now serving as Superintendent and Assistant Superintendent of the combined school and treatment centre.

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# DECENTRALIZATION OF INTERNATIONAL HEALTH WORK IN THE AMERICAS

## Zone II Cuba, the Dominican Republic, Haiti and Mexico

*The Pan American Sanitary Bureau (PASB) which serves as the WHO Regional Office for the Americas started to decentralize its activities over seven years ago and by 1952 it had six Zone Offices in various parts of the Americas<sup>1</sup> This system has been found particularly useful for maintaining with national health authorities the close relationship required for the successful planning and implementation of well balanced programmes The article below outlines the progress achieved in Zone II—which comprises Cuba the Dominican Republic Haiti and Mexico—during the past few years It will be followed in future numbers of the Chronicle by articles on the work of the other Zone Offices*

In 1952 the Pan American Sanitary Bureau decided to establish a Zone Office in Mexico City to serve Cuba the Dominican Republic Haiti and Mexico The number of PASB/WHO assisted health projects in the four countries was then relatively small today it has risen to 55 Zone II office and project staff numbered 86 at the end of 1957 as compared with 15 in 1953

### Mexico

The malaria eradication programme in Mexico is the most important PASB/WHO assisted project not only in Zone II but in the whole Region of the Americas<sup>2</sup> Full scale spraying operations—planned to con-

tinue for four years—started in January 1957 and are proceeding satisfactorily An international training centre has been set up in Mexico to give antimalaria workers from other countries the benefit of the principles and methods evolved in the course of the eradication programme PASB/WHO is assisting this centre by providing a training consultant supplies and equipment by granting fellowships to trainees from other countries and by co-operating with the Mexican health authorities in the planning of curricula and the supervision of field training

With regard to yellow fever there is reason to believe that the *Aedes aegypti* population in Mexico is decreasing as a result of the antimalaria operations More and more persons travelling to jungle areas are being vaccinated against yellow fever and the Zone Office has facilitated the delivery of increasingly large supplies of vaccine from the Instituto Carlos Finlay in Bogotá Colombia

With the co-operation of UNICEF PASB/WHO has helped to establish comprehensive local health services in one large district of the State of Guanajuato These services are gradually being extended to cover the whole State and are intended to

<sup>1</sup> Zone II offices were established in Mexico City, Lima, Bogotá, and Havana. Zone I offices were established in Washington, D.C., and New York. Zone III offices were established in Rio de Janeiro, São Paulo, and Salvador. Zone IV offices were established in Lima, Bogotá, and Havana. Zone V offices were established in Lima, Bogotá, and Havana. Zone VI offices were established in Lima, Bogotá, and Havana.

<sup>2</sup> See *Chronicle of Diseases* 1958 12 140

serve as a model and nucleus for health services throughout the country

PASB/WHO is also assisting the Mexican health authorities in rabies control tuberculosis studies the production of smallpox vaccine the improvement of laboratory services the establishment of rural social welfare units environmental sanitation the development of nursing services health education and the training of public health workers

Two seminars recently held in Mexico by PASB/WHO have led to important developments in national health planning. The first was a seminar on the teaching of preventive medicine held in Tehuacán in 1956 following which 13 schools of medicine in Mexico have established chairs in this subject. The other was the seminar on diarrhoeal disease in childhood held also in Tehuacan in 1957<sup>4</sup> the Mexican participants in this seminar have already undertaken to apply its conclusions and recommendations in the country's public health services

## Haiti

An example of effective co operation between PASB WHO and the Haitian health authorities is the jaws eradication campaign now in its final stages. There are no cases of jaws in the north of Haiti and eradication is almost completed in the south.

In the antimalaria programme PASB WHO is responsible for over all administration and for the conduct of field activities. The programme is about to switch over from control to eradication. Progress has been made in the retraining of control workers and in the selection and training of new personnel while the delimitation of malarious areas is almost complete.

Other aspects of the Haitian public health programme receiving PASB WHO assistance include *Aedes aegypti* eradication smallpox vaccination and the reorganization of the public health laboratory. A planning board for public health services has been set up with the participation of PASB/WHO and

the US International Co operation Administration. Following a survey of the medical school in Haiti the Zone II Office has made proposals for the reorganization of the teaching programme and the improvement of teaching methods.

## The Dominican Republic

The success of the model health centre at San Cristobal—which was started with the co operation of a PASB/WHO team—has led to the creation of a similar centre in Ciudad Trujillo and a sub-centre in Haina. The training courses for staff for these centres are under the guidance of PASB consultants.

A sanitary code prepared with PASB/WHO assistance was recently approved while all public health forms have been revised in order to establish a uniform system of health records throughout the Republic. The statistical consultant for Zone II helped in the reorganization of the national Department of Statistics and the death certificate form approved by WHO has been introduced.

The extensive environmental sanitation programme covers drinking water control food handling supervision of waste disposal facilities construction of latrines in communities and schools and sanitary land filling. PASB WHO is co operating in malaria and *Aedes aegypti* eradication and in other programmes for the control of communicable diseases.

A national nursing school has been established with PASB/WHO assistance and plans are under way for a survey of the medical school similar to that carried out in Haiti. Special training courses on venereal disease control midwifery and sanitation have been organized for professional and auxiliary staff.

A "round table" on public health problems in the Dominican Republic is to be held this year with the participation of PASB/WHO staff from the Zone II Office and the Regional Headquarters in Washington DC.

In Cuba special attention is being paid to malaria and *Aedes aegypti* eradication the production of smallpox vaccine and training in sanitary engineering and veterinary medicine. Modern health centres with full time staff are planned for the near future. As in the Dominican Republic the PASB/WHO statistics consultant has helped with the reorganization of the country's health statistics system. A number of Cuban professional health workers attended PASB/WHO sponsored seminars in 1957.

The Zone II nursing adviser has encouraged a study of nursing problems and resources in

the country and PASB/WHO is planning a national seminar on nursing.

\* \* \*

As well as assisting in specific health programmes PASB/WHO continues to grant fellowships for studies abroad to professional health workers in all countries of the Zone. There is no doubt that the health standards of these countries—which have a combined population of 42 000 000—have greatly improved during the past few years and that the technical and advisory services provided by PASB/WHO through its Zone Office in Mexico City have contributed to this improvement.

## POLIOMYELITIS SURVEY IN GUATEMALA\*

From 1943 to 1948 only 42 cases of paralytic poliomyelitis were reported in Guatemala. In 1949 however 62 cases were reported and since 1952 there has been an average of over 100 reported cases a year in a population of some 3 million. When it became clear that the disease was endemic in the country a Poliomyelitis Rehabilitation Centre was opened on the outskirts of Guatemala City. This Centre gradually assumed responsibility for all poliomyelitis work in the country and its record—particularly in the treatment of acute cases—has been excellent.

Nevertheless the incidence of the disease has remained high. Although a vaccine is now available the indiscriminate vaccination of the population would be costly. In the autumn of 1957 the Guatemalan health authorities therefore invited the Pan American Sanitary Bureau (PASB) which acts as WHO Regional Office for the Americas to study the situation and offer recommendations.

The PASB/WHO team sent to Guatemala for this purpose consisted of a member of

the Yale Poliomyelitis Study Unit (which serves as the WHO Regional Poliomyelitis Centre) and a member of the staff at PASB Headquarters in Washington D C.

### Aims of the survey

The PASB/WHO team carried out a serological survey of the population for the general purpose of determining by age group the occurrence of antibodies against the three types of poliovirus so that the immunization programme could concentrate on the groups at greatest risk. The specific aims of the survey were

(a) to determine the degree of "natural" immunity to poliomyelitis in normal Guatemalan children and adults as reflected by the antibody patterns in different age groups in both urban and rural areas

(b) to screen children between 6 months and 3 years of age for poliovirus and other enteric viruses by collecting and testing rectal swabs

(c) to see if Guatemala would be a suitable open community for future trials with attenuated live poliovirus vaccine

After the team arrived in Guatemala it was decided also to compare antibody titres in blood samples collected from vaccinated and unvaccinated children in the same age groups

### Workin methods

The groundwork for the survey was laid by consultations with health officials and by a review of available statistical data on the poliomyelitis situation in Guatemala and on the limited vaccination programme then being carried out by the Government. These data suggest that in Guatemala poliomyelitis is largely a disease affecting young children over 80% of the cases reported being children under 5 years of age. Cases occur throughout the year without the marked seasonal incidence experienced in countries where the seasons are more clearly differentiated. Almost half the reported cases occurred in Guatemala City.

In Guatemala City 201 blood samples were taken from normal or non-febrile individuals in health centres, hospitals and schools including 32 from children who had been vaccinated against poliomyelitis. In addition 35 samples were taken from children up to 5 years of age in a semi-rural area.

Rectal swabs were collected from 117 children under 3 years of age and from a group of 45 adults including a number of the children's mothers. The team hoped to find out whether the taking of rectal swabs could help to determine the percentage of the infant or adult population carrying poliovirus or other faecal viruses at a given time of the

year since this information would be very useful in planning a vaccination programme with attenuated live poliovirus vaccine.

### Results

The blood and stool samples were sent under refrigeration to the WHO Regional Poliomyelitis Centre at Yale University for analysis. The preliminary results of virus isolations from rectal swabs are as follows:

— Of 7 patients with paralytic poliomyelitis whose stools or rectal swabs were tested 3 were positive: one for type 1 poliovirus and two for type 2.

— Of 16 swabs from normal children from Guatemala City 5 were positive: one for type 2 poliovirus and four for agents not yet identified. No virus was isolated from rectal swab specimens from 10 of the children's mothers.

— Of 27 normal children from the semi-rural area surveyed, 7 were found to be excreting virus: type 1 poliovirus in two cases and in the remainder other enteric agents not yet identified.

When the antibody levels of the sera have been determined and the prevalence of poliovirus and other enteric viruses has been established by testing all the rectal swabs it should be possible to offer the Guatemalan authorities guidance on the policy to follow in their vaccination programme. The findings of the survey should be helpful also to other Central American countries faced with the same problem.

### Tariffs of sanitary charges

Under the International Sanitary Regulations, health administrations are requested to notify WHO of the tariff of charges in force in their territories for the application of sanitary measures provided for in the Regulations (e.g. vaccination of departing travellers, disinfection, ratting and dissection, quarantine isolation and observation). An appendement to a recent number of the WHO Bulletin *Epidemiological Record* (No. 20, 1958, Supp. 2) lists the tariffs force on 16 May 1958 for such measures in more than 100 countries and territories.

## COLOMBIA A COMPREHENSIVE INTERNATIONAL HEALTH PROGRAMME \*

The health authorities of Colombia are at present carrying out a comprehensive health programme with international assistance from the Pan American Sanitary Bureau (PASB) which acts as the WHO Regional Office for the Americas. The PASB/WHO team consists of a Country Co-ordinator stationed in Bogotá and 14 consultants. Other agencies including the US International Co-operation Administration (ICA) and UNICEF co-operate in certain projects.

### ● Malaria eradication

The plan for malaria eradication provides for complete coverage of all houses in the country's malarious areas where the population is over 9 million. Spraying started in July 1958 and will continue for four years. The PASB/WHO staff for this project will be increased from 2 to 6 persons in the course of this year and the Bureau will supply vehicles, drugs, equipment, fellowship grants and training facilities. UNICEF is also contributing substantially to the eradication campaign.

### ● Smallpox eradication

PASB/WHO provides the services of a medical consultant and a vaccination inspector to advise the Colombian health authorities on the planning and implementation of the country's smallpox eradication campaign which is one of the principal items on a regional programme to eradicate the disease from the Americas. A training fellowship in connexion with the campaign has been awarded by PASB/WHO which has also supplied a certain amount of dried smallpox vaccine. UNICEF has provided the equipment for a dried vaccine production unit.

### ● *Acute* *egypti* eradication

A campaign to eradicate the vector of urban yellow fever started in the Caribbean coastal area in May 1952 and is proceeding satisfactorily. Two experts—a medical officer and a sanitarian—have been assigned by PASB/WHO to assist in this work.

### ● Collaboration with the Instituto Carlos Finlay

The Instituto Carlos Finlay in Bogotá is one of two laboratories in the Americas which provide yellow fever vaccine and diagnostic services free of charge to other countries in the Region. During 1957 it supplied some one million doses of vaccine to other countries and several thousand doses for use in Colombia. PASB/WHO makes an annual grant to the institute and the Director of PASB serves its Advisory Committee.

### ● Leprosy control

The true extent of leprosy in Colombia is as yet unknown. A PASB/WHO consultant is co-operating with the Government in making a complete study of the problem and establishing a control programme based on modern techniques.

### ● Public health services

A team of 6 PASB/WHO consultants assists the general public health programme which developed from a maternal and child health project two years ago. The three principal features of the programme are:

(a) Reorganization of the central public health services with the assistance of the first full-time health officers to be trained under the programme (see (b) below) and of a Planning Commission which includes the PASB/WHO Country Co-ordinator.

(b) Training of personnel. Special training has already been given to 14 doctors, 14 public health nurses, 20 sanitary inspectors and 14 auxiliary nurses.

(c) Establishment of local health services with full-time personnel in the area where trainees are completing their field practice. These will form the nucleus of a system of local health services which will eventually cover the whole country.

In view of the dispersal of health activities in Colombia and the number of consultants engaged in the internationally assisted health programme, the work of the PASB/WHO Country Co-ordinator is of particular importance since he acts as *liaison officer* with senior officials helping to resolve any difficulties that may arise. This method of co-ordination has proved extremely successful in helping the national health authorities to benefit fully from the international aid provided.

# THE PRICE OF MALARIA ERADICATION IN THE AMERICAS

*By the beginning of 1958 the Special Malaria Fund of the Pan American Sanitary Organization (PASO) had acted as the WHO Regional Committee for the Americas made it possible to some \$4 300 000. It had pledged to the States the relatively modest sums of \$1 million for the first year and \$2 million for the second year. The programme for the eradication of malaria in the Americas and the PASO is the first step in the programme of the WHO to eliminate malaria from the world.*

Experience in many countries has shown that individual lives and national potentialities can be radically changed as a result of malaria eradication and a number of governments are already basing their long range economic plans on the estimated post eradication resources and needs of their countries. Nevertheless the extent of the problem is such that in some countries malaria eradication programmes tend to fall behind.

With regard to malaria the countries and territories of the Americas may be divided into three categories:

(i) *With no history of malaria in recent years.* Only Canada, Uruguay and a few small Caribbean islands come within this category.

(ii) *Where malaria eradication has been achieved.* Barbados, Chile, Martinique and the United States are in this position. The area of eradication covers almost 900 000 square miles with a population of some 45 million.

(iii) *Where malaria has not yet been eradicated.* In this group of 18 countries and 11 territories malaria was originally reported to affect 4.7 million square miles containing over 85 million people<sup>1</sup>. The disease has still to be eradicated from about 95% of this area although campaigns are at an advanced stage in some countries (see map on page 310).

In other words the area from which

malaria must still be eradicated is approximately five times that of the countries and territories where eradication programmes have been completed and contains almost twice their population.

## Estimated costs

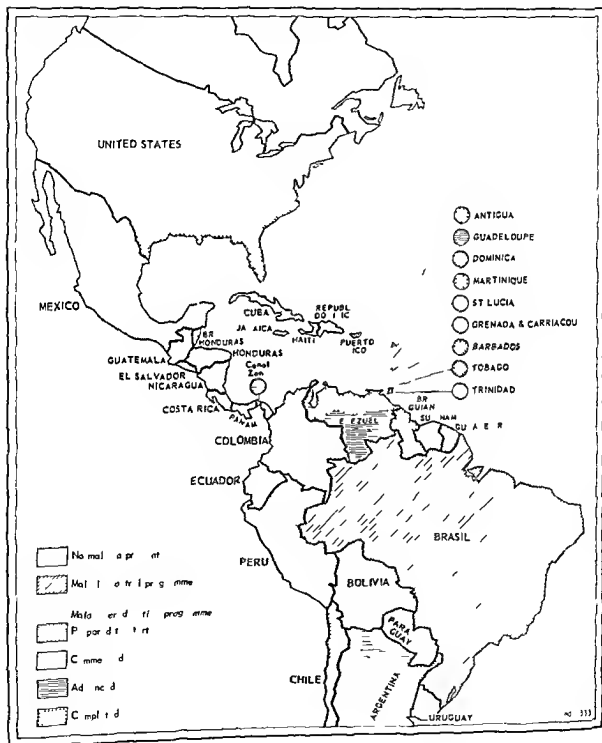
Although the cost of eradicating a disease as firmly entrenched as malaria is high it more than offsets the economic losses caused by the disease itself. In Peru for example recent estimates put the annual economic damage caused by malaria at some \$26 000 000 yet a total expenditure of about \$8 000 000 would probably finance the eradication of the disease from the country within four years. However it is not always possible to raise so large a sum for an eradication programme especially in those countries where the need is greatest.

In March 1957 the Pan American Sanitary Bureau calculated that the total cost of malaria eradication in the Americas would be about \$157 000 000. This calculation assumed a concentrated campaign of five years duration in each country or territory involved. From recent estimates it appears that all countries in the Americas will have completed their eradication campaigns by 1965 or 1966.

## The international contribution

The international contribution to the malaria eradication programme for the Region is estimated at \$40 039 997 or slightly over one quarter of the total required.

<sup>1</sup> Adapted from an article by P. S. O. Wernert, 1958, 2, 1, 1.







The Executive Board of UNICEF has already approved in principle a contribution of \$14 234 047 which will cover a substantial part of the cost of insecticides, spraying equipment and transport UNICEF is also planning to furnish supplies and equipment to a value of \$5 534 853

This leaves a balance of \$20 271 097 to be covered by international contributions of which some \$4 000 000 is already credited to the PASO Special Malaria Fund The financial plan for the Organization's participation in the programme is outlined in the table on page 311 it is of course contingent on the availability of the full amount The estimates fall off sharply after 1962 as by then the campaigns will be drawing to an end

Outside the framework of the general programme the US International Co-operation Administration contributed \$2 000 000 to selected antimalaria campaigns in the Americas during the US fiscal year ending 30 June 1958

#### Growth of the PASO Special Malaria Fund

The Special Malaria Fund was established in January 1955 with an allocation of \$100 000 from 1954 surplus PASO funds as authorized by the XIVth Pan American Sanitary Conference<sup>2</sup> An increase in the

Fund from available surpluses was authorized later in the same year by the PASO Directing Council At the beginning of 1957 the Fund stood at \$154 593 and provision was there fore made in that amount for technical assistance supplies fellowships and conferences Then in March 1957 the United States Government made a special contribution of \$1 500 000 to PASO for malaria eradication This was followed a month later by the announcement of a donation of \$500 000 (to be paid in five annual instalments of \$100 000) from the Government of the Dominican Republic Shortly afterwards the Government of Venezuela made a contribution of \$299 600 (1 000 000 bolivars) and in December 1957 the US Government made a further grant of \$2 000 000 Thus by the beginning of this year voluntary contributions to the Fund amounted to \$3 899 600 with a further \$400 000 pledged<sup>4</sup>

The fact that so many generous donations to the Fund have been received in the space of one year reflects a growing awareness of the malaria problem on the part of the American governments There is therefore every reason to suppose that the necessary sums will be forthcoming to enable PASO to meet its future commitments in the general malaria eradication programme of the Region

Summary of the Special Malaria Fund  
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## PLAN FOR LEPROSY CONTROL IN PARAGUAY\*

The health authorities in Paraguay are paying special attention to leprosy which is one of the country's most important endemic diseases In 1953 the Paraguayan Leprosy Department—assisted by a WHO consultant Dr Lauro de Souza Lima—prepared a leprosy control plan with the following features (a) detection of cases of indeterminate type (which constitute latent foci of

contagion) followed by sulfone treatment to render them non contagious (b) control of family and other contacts (among whom the majority of cases of indeterminate type are found) (c) abolition of coercive measures such as compulsory isolation in accordance with the modern concepts of leprosy control advocated by the Third Pan American Conference on Leprosy (Buenos Aires 1951)

In 1955 a preliminary survey of school children between the ages of 6 and 15 was

\* Summary of an article by Dr Amílcar Aguado Galí published in *Bol. Of. San. Int. Pan Am.* 1958 44 411

carried out in the towns of Asuncion and Luque. The aim was to detect leprosy cases to start treating them and to carry out dermatological examination and lepromin testing of contacts. Among 7390 children examined in Asuncion 16 cases were detected, while 4 cases were found among the 1589 children examined in Luque. The prevalence rates being 2.16 and 2.50 per 1000 respectively.

### General plan of operations

The general plan for leprosy control in Paraguay was prepared with technical assistance from WHO and material aid from UNICEF. It includes detection of cases and foci of infection, control of contacts, preventive measures, health education and specialized training in leprology.

### Detection of cases and foci of infection

Cases are detected by large scale dermatological examination of persons belonging to certain social groups such as students, recruits, civil servants and manual workers. For the rest of the population it is necessary to rely on compulsory examinations for health certificates, case finding at official health centres and examinations to confirm notified cases. The Leprosy Department will continue to employ these methods until people can be encouraged through health education to come for examination voluntarily and the endemic finally dies out.

Case finding also helps to establish the foci of infection, each of which has three elements: the individual source of contagion, the detected case and family and other contacts.

### Treatment

Once cases and foci have been detected, patients are registered and classified and outpatient treatment begins. The drug usually employed is 4-4'-diaminophenyl sulfone with iron salts and vitamin B<sub>1</sub> as adjuvants in most cases. If the drug is not tolerated or if resistance or habituation threaten to develop, other derivatives of this

sulfone have to be employed, administered by the endovenous route. These can be very useful in the acute phases of the disease. For the treatment of complications of the lepromatous reaction type, the following drugs are recommended: calcium gluconate, sodium hyposulfite, antimony salts and in the case of certain ocular complications, antibiotics and cortisone. The Leprosy Department is going to try out a system of treatment with the parent sulfone in hydrogel suspension—administered monthly or every three weeks—and the isopropylate or monopropylate sulfones administered orally once a week.

### Control of contacts

This is one of the most important features of the campaign and begins as soon as a focus has been located. Control is exercised by means of dermatological and neurological examinations.

Since the number of foci increases as case finding progresses, this task will require the services of an increasingly large staff and will have to be carried out systematically on the basis of the following criteria: (a) *lepromin rate in the focus* (obtained by applying the lepromin test to all contacts and classifying them into Mitsuda positive and Mitsuda negative); (b) *clinical form of the disease* (lepromatous, tubercular or indeterminate types; the patients in the indeterminate group being considered as lepromatous for control purposes); (c) *age of contacts* (an important factor in susceptibility to infection).

The Leprosy Department is concentrating on three types of contacts: without resistance (Mitsuda negative), particularly exposed to infection (contacts of lepromatous cases) and particularly susceptible (younger age groups). Dermatoneurological examinations of all cases will be carried out over a minimum period of five years and every effort will be made to persuade patients to bring their contacts to the clinic for examination.

### Preventive measures

Compulsory segregation in leproseries has been abolished, but the Leprosy Department is authorized to enforce more or less temporary hospitalization in certain cases, e.g.

when home conditions are bad when specialized treatment is needed or when newborn babies have to be protected from the disease

In the absence of any means of immunization against leprosy BCG vaccination is used for all Mitsuda negative contacts this makes them Mitsuda positive and thus more resistant to infection

#### *Health education and specialized training in leprology*

The above mentioned activities will be supplemented by a health education programme and facilities for the specialized training of medical personnel in leprology. The health education programme will be

aimed at the general public the medical profession and patients undergoing treatment in dispensaries and health centres. It will stress the contagious nature of leprosy its initial symptoms the possibilities of sulfone therapy and the advantages of early diagnosis. It will also seek to remove the stigma attaching to leprosy and to make patients understand that with regular treatment the disease can be cured.

The specialized training programme will include theoretical and practical courses for new and future members of the Leprosy Department and for medical officers attached to national health services together with in service training and fellowships for study abroad.

## *Notes and News*

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### **Public health training for foreign students**

In many countries which are building up their health services there are no facilities for the public health training of the physicians who are to direct and staff these services while in others the available facilities are insufficient to meet the needs of every candidate. To help solve this problem WHO awards a number of fellowships for post graduate studies in public health abroad. Under this scheme 205 fellows—mostly physicians—from 62 countries and territories were able to take courses for diplomas in public health in the years 1954-57.

It may be asked whether the training given to these students is meeting their needs at home. The answer to this question is to be found in the reports received by WHO both from the students themselves and from professors who have had the opportunity—also through WHO fellowships—to see at first hand the needs of the countries from which their foreign students come. While the courses have on the whole been found satisfactory both professors and students have suggested certain adjustments

A group of experts including deans and professors of schools of public health was convened by WHO during July to discuss how public health courses might be adjusted to meet the needs of foreign students attending them. The following topics were reviewed among others: the integration of foreign students into the class; the curricula and organization of courses attended by these students; facilities for field training and admission requirements in relation to the different backgrounds of foreign students.

Should publication of the report of this group of experts be authorized by the WHO Executive Board at its session in January 1959 it will appear in the WHO Technical Report Series in the spring of that year.

### **Courses in public health dentistry**

A survey completed last year by the Pan American Sanitary Bureau (PASB) WHO Regional Office for the Americas revealed an acute shortage of public health dentists in the majority of countries in the Region. An agreement was therefore concluded between the University of São Paulo (Brazil) PASB/

WHO and the Kellogg Foundation for the provision of public health dentistry courses at the University's school of public health

The courses which are open to students from other Latin American countries as well as Brazil were prepared by the teaching staff of the University with the co-operation of the PASB/WHO regional adviser in dental health. The first courses started in February of this year and were attended by 17 students from 8 countries. 8 of the students had been awarded PASB/WHO fellowships.

Other agencies are co-operating by providing guest lecturers to extend the range of the courses. Thus the US International Co-operation Administration adviser to the Brazilian Special Public Health Services is teaching techniques based on time and motion studies and designed to eliminate wasteful movements in dental practice.

### Histological definitions of cancer types

Formerly WHO's contribution to the study of cancer was restricted to the statistical analysis of mortality and morbidity data<sup>1</sup>. During the last few years, however, studies on the epidemiology of cancer carried out in various parts of the world have underlined the importance of geographical pathology and the need to attack the problem on an international level. Consequently WHO has felt obliged to revise its programme of activities in this field. As early as 1955 a group of consultants recommended that laboratories with special experience should be made responsible for maintaining collections of histological material to serve as reference standards for laboratories all over the world<sup>2</sup>. The ultimate aim is to establish histological definitions which would facilitate the adoption of a uniform nomenclature. The confusion which at present exists with regard to the meaning of terms applied to various types of cancer has in fact already retarded the progress of a number of studies.

In accordance with a resolution adopted by the WHO Executive Board in 1956 a Study

Group was convened to examine what action might be taken. The Group recommended that WHO should designate international centres to work in liaison with specialist institutes in various countries. Some countries already have reference centres as indicated in reports presented to the Study Group. In the United States for example there are many large pathology laboratories associated with schools of medicine or with hospitals. The American Registry of Pathology with the support of the National Research Council and various medical associations maintains large collections of tumours contributed by pathologists.

In India the Registry of Hepatic Pathology attached to the Agra Medical College has a collection of material from different parts of the country which it puts at the disposal of research workers and schools of medicine. The Registry also serves as a centre for the exchange of material with other countries. It is proposed in the near future to establish similar registries of oropharyngeal and ovarian tumours.

In Norway five laboratories provide diagnostic services. Follow up and control of diagnoses are greatly facilitated by the Norwegian Cancer Registry which is an independent institution.

In the United Kingdom the Cancer Registry maintained by the General Register Office receives reports on cancer cases from many hospitals.

In Africa and South America the immense distances, transport difficulties and the wide areas served by some of the medical centres are serious obstacles to the implementation of the project under discussion. Nevertheless the centres in some large cities could provide certain facilities.

The members of the Study Group discussed the criteria to be adopted for selecting the types of cancer for the preliminary studies. It was suggested that the choice should be based on frequency, variation in geographical distribution, importance to public health (epidemiology and prevention), the value of a standardized nomenclature for diagnosis and treatment, and the degree of confusion in existing nomenclature. Tumours of the liver

<sup>1</sup> See Chron. Wld Hlth Org 1955 9: 234, 1956, 10: 45, 406.

<sup>2</sup> See Chron. Wld Hlth Org 1955 9: 37.

lungs salivary glands breast oropharynx skin and soft tissue were then considered by the Group from these various angles. Finally it was decided that it would be advisable to limit the initial programme to the following sites in order of priority: oropharynx, lungs, soft tissue, breast.

The centres would be established in several countries (the proposals covered three continents) which already have laboratories specializing in and suitably equipped for this kind of research. Their function would be to establish definitions of cancer types in collaboration with other specialists. When agreement had been reached the histological preparations would be placed at the disposal of the various national institutes. These in their turn would be able to obtain advice from the international centre in difficult cases.

In addition to giving financial aid to the international centres, WHO would organize the distribution of information and reports to governments and would seek the collaboration of non-governmental professional organizations. The Study Group expressed the hope that the proposed system of international centres would receive the support of the pathologists themselves and of non-governmental organizations interested in the establishment of histological definitions of cancer types.

#### Water supplies in the Eastern Mediterranean Region

Technicians from 12 countries in the Eastern Mediterranean Region took part in a waterworks training course held under WHO auspices in Alexandria Province of Egypt, United Arab Republic, during May. The course was conducted by water and sanitation specialists from Egypt, the Netherlands, and the WHO Regional Office for the Eastern Mediterranean.

Participants in the course were invited to submit statements—of a personal and unofficial nature—on waterworks facilities in their respective countries. From these statements it appears that supplies of pure drinking water are still inadequate in many parts of the Region, and particularly in rural

areas. The proportion of the population served by modern water supply systems is insignificant in certain territories with scattered populations, such as Somalia, and in some places it is relatively high (50% in Jordan, 70% in Iraq and 80% in Egypt).

The rapid growth of the population in some of the large cities of the Region has added to the problem. In Amman, Jordan, where the population has risen from 30 000 to 200 000 in only ten years, the water resources consist of two springs and two wells, the output of which fluctuates according to the rainfall. During the dry season the daily consumption of water per head cannot exceed 50 litres and the water distribution network can function only intermittently. A similar situation has arisen in Karachi, West Pakistan, and in Beirut, Lebanon.

The towns of Egypt are relatively more favoured; they are served by 40 water supply plants and 6 water processing installations which permit an average daily consumption of 120 litres per head (250 litres in Cairo and Alexandria). Underground waters are the main sources of supply in Upper Egypt and the southern part of the Nile Delta, and 1400 pumping stations already distribute drinking water to 8 million of the country's rural inhabitants. In the Fayoum district and the northern part of the Nile Delta, 60 plants, some with a daily output of 3000 m<sup>3</sup>, are each supplying purified water to an average of 30 000 inhabitants of rural communities.

Similar rural water supply networks exist in Jordan and Saudi Arabia (see below), both of which are richly endowed with underground water, but they are far more costly than those in Egypt, where the density of the rural population is greater.

Rivers and streams are the main sources of water supply in Iraq, and to a lesser extent in Pakistan and Lebanon. Eighteen plants connected with the Tigris and Euphrates rivers supply 5 million of Iraq's 7 million inhabitants with purified drinking water. Most of the country's rural areas, however, are still unprovided for in this respect.

In Pakistan also few rural areas are supplied with treated water although it is available to 50% of the urban inhabitants. Under the 1955-60 five year plan water supplies are being extended to more rural and urban areas but as the total population of Pakistan is 80 million the country's waterworks technicians are faced with a formidable task. A comparable situation exists in Iran where despite recent improvements only 2% million of the country's 20 million inhabitants as yet enjoy a supply of pure water.

In Saudi Arabia most of the water has to be drawn from underground sources which are sometimes as much as 1500 metres below the surface. The question of drinking water supplies is particularly important in Mecca which is visited by about a million pilgrims each year. There rainwater flowing from nearby mountains is collected in two large man made cisterns known traditionally as the "Zobeida" and "Azizia" springs. It is then fed into small collective tanks the contents of which are intermittently chlorinated. Doubts have been raised about the effectiveness of this system and other means of purifying the Holy City's water are being considered.

#### Smallpox epidemic in Pakistan

During June WHO shipped two million doses of smallpox vaccine to Pakistan in response to a request from the Government for help in dealing with the worst smallpox epidemic the country has experienced since its creation in 1947. This emergency shipment was authorized following consultation with members of the WHO Executive Board.

Preliminary estimates indicate that during the first five months of 1958 there were more than 35 500 smallpox cases and more than 15 800 deaths from the disease in Pakistan nearly all of them in the eastern part of the country. The corresponding figures for the same period last year were 13 400 and 5900. The incidence of the disease in Pakistan which usually reaches a peak every six or seven years has been increasing steadily since 1954 amounting to almost 25 000 cases in

1957. Mass vaccination of the population is expected to prevent a repetition of the situation in 1944 when there were 140 000 deaths from smallpox in Bengal (now divided into East Pakistan and the Indian State of West Bengal).

#### Malaria conference in Bucharest

Malaria has been eradicated from Italy and Corsica and is on the decline in other parts of Europe which may thus become the first continent to wipe out the disease. To achieve this aim however firm and energetic action is still required.

Under the auspices of the WHO Regional Office for Europe representatives of ten countries of South East Europe and the Eastern Mediterranean Region met in Bucharest in June to discuss their common malaria problems and the co-ordination of their campaigns against the disease. This conference continued the work of two earlier conferences held in Belgrade in 1955 and 1957. The following countries were represented: Afghanistan, Albania, Bulgaria, Greece, Iran, Romania, Turkey, United Arab Republic (Province of Syria), USSR and Yugoslavia.

#### Recommended requirements for poliomyelitis vaccine

Manufacturing and control requirements that can be internationally recommended in order to ensure safe potent and reliable preparations of poliomyelitis vaccine have been formulated by the WHO Study Group on Recommended Requirements for Poliomyelitis Vaccine which met recently in Geneva. When issued these requirements are expected to facilitate the international exchange of poliomyelitis vaccines and to be helpful to countries wishing to start vaccine production and control.

The following experts took part in the meeting of the Study Group: Dr O. Bonin (Germany), Dr D. G. Evans (United Kingdom), Professor S. Gard (Sweden), Dr J. H. S. Gear (Union of South Africa), Dr A. Lafontaine (Belgium), Dr P. Lepine (France), Dr H. von Magnus (Denmark).

lungs salivary glands breast oropharynx skin and soft tissue were then considered by the Group from these various angles. Finally it was decided that it would be advisable to limit the initial programme to the following sites in order of priority: oropharynx, lungs, soft tissue, breast.

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The tuberculin of the new batch in the new diluent will thus be more active than the preparations used hitherto. Technical instructions are being addressed to the laboratories preparing dilutions used for tuberculin tests. No change in the screening criteria for tests is needed.

### Malaria control in Africa

Between January and May 1958 Dr M. A. C. Dowling, WHO regional malaria adviser for Africa, visited a number of countries and territories south of the Sahara to study anti-malaria programmes and advise on their conduct. New malaria projects have been started or have reached the final planning

stage in several of these countries and territories namely British Somaliland, French Cameroons, French West Africa (Dahomey, Senegal and Upper Volta), Liberia, Togo and Uganda. In the Federation of Rhodesia and Nyasaland a plan for intensified research on malaria is in preparation and training courses for antimalaria workers have been started in Tanganyika. In Ghana Dr Dowling had discussions with the WHO Advisory Team on *Anopheles gambiae* whose services have been made available to all African governments by the Organization. The WHO adviser also visited Kenya, Madagascar, Mauritius, Nigeria and Zanzibar to review the progress of malaria projects or discuss future operations with the responsible authorities.

## People and Places

### Yaws control in the South Pacific

For the past four years a WHO team has been helping governments of various island territories in the South Pacific to organize yaws control campaigns. The team also trains local personnel in the diagnosis, therapy and epidemiology of yaws.

Dr Ping Nan Wan has joined this team as serologist for the yaws control campaign in the New Hebrides. A graduate of the Okuyama University Medical School, Japan, Dr Wang is on loan from the Serum Vaccine Laboratory in Taiwan (China). Here he has been responsible for the training and supervision of serological laboratory staff working in the WHO-assisted venereal-disease control campaign.

### Training of occupational health workers

Professor Sven Forssman of Sweden has succeeded Professor Leonard J. Goldwater of the United States as WHO visiting professor at the Department of Occupational Health attached to the High Institute of Public Health, Alexandria, Province of Egypt, United Arab Republic. This appointment is in accordance with the Institute's policy of having, as visiting professors of occupational health, leading specialists from schools in different parts of the world. In this way it is hoped to make the Institute's training courses in this branch as comprehensive as possible.

Professor Forssman is Associate Professor of Occupational Health at the Karolinska Institute, Stockholm and medical adviser to the Swedish Employers' Confederation. He has been associated with WHO since 1950 and has carried out occupational health surveys in India and Egypt on behalf of the Organization.

### Exchange of teachers

In co-operation with Johns Hopkins University, Baltimore, Md., USA, and the Rockefeller Foundation, WHO is helping to strengthen the faculty of the Institute of Hygiene, University of the Philippines, Manila, by organizing a programme of exchange between members of the teaching staffs of the Institute and the Johns Hopkins University School of Hygiene and Public Health.

Dr Paul V. Lemkau, of Johns Hopkins University, is at present in Manila to advise the Institute of Hygiene on changes in the field of mental health. Formerly Director of Community Mental Health Services, New York, and Chief of the Division of Mental Health, State Health Department, Maryland, Dr Lemkau made surveys of mental health facilities in Yugoslavia and Japan in 1951 and 1953 respectively under WHO auspices.

### Bilharziasis control in the Philippines

Since June 1952, a WHO team has been engaged in a pilot project for the control of bilharziasis in



Dr R. Murray (United States), Dr G. Penso (Italy) and Dr V. Soloviev (USSR). Dr U. Krech (Switzerland) attended the meeting as a consultant.

#### Expert Committee on Auxiliary Dental Personnel

The WHO Expert Committee on Auxiliary Dental Personnel met in Geneva at the end of June to discuss the expansion of dental services throughout the world by the use of auxiliary personnel and with this end in view to consider a classification of these services which would be applicable to countries in varying stages of cultural and economic development. Such a classification could have a wide range and training requirements for auxiliary personnel could be adjusted accordingly.

The following experts took part in this meeting: Dr J. Deeny (Ireland), Dr A. I. Domnikov (USSR), Dr A. Maxwell Horsnell (United Kingdom), Dr Olof K. Osvald (Sweden), Dr Shailer Peterson (USA), Dr J. Llewellyn Saunders (New Zealand) and Dr C. J. Sundram (Malaya). Professor F. C. Wilkinson, Dean and Director of Studies, Institute of Dental Surgery, London University, acted as consultant to the Committee.

#### Post graduate nursing courses in Indonesia

In 1952 the Government of Indonesia opened a post graduate school for the training of nursing teachers at Bandung with assistance from the US Technical Cooperation Administration (now the US International Cooperation Administration). The Government then decided to extend the school's programme to include courses in the teaching of midwifery and in public health nursing. WHO and UNICEF were asked to assist this project by providing staff and equipment respectively. Between January 1954 and September 1957 two WHO public health nurses (Miss B. Hegarty and Miss G. M. Pringle) and two WHO midwifery tutors (Miss A. Milton and Miss V. Gibbs) were assigned to the school to organize and develop the additional courses.

In planning these courses—which are now being continued by the school's Indonesian staff—an attempt was made to combine classes in both branches where appropriate and the curricula were revised several times to ensure adequate training. Special attention is paid to field work which is carried out at two centres—municipal and semi rural—serving between them a total of some 180 000 people. The public health nursing students gain practical experience in maternal and child health centres and in a school health service; they are also allowed to undertake teaching and home visiting. The future midwifery tutors have an opportunity to practice teaching at hospitals, clinics and midwifery training schools. During the period of WHO assistance 30 public health nurses and 43 midwifery tutors were trained by the school and all have found suitable employment.

#### Preparation of a new batch of tuberculin for vaccination campaigns

Batch RT 22 of purified tuberculin (PPD) prepared and held by the Statens Serum Institut, Copenhagen, has been used since 1950 in systematic BCG vaccination campaigns and is now nearly exhausted. A new batch of 650 g (RT 23) has just been prepared by the same institute at the request of WHO and UNICEF. It is expected to meet the demand for tuberculin for more than ten years.

Tests in humans have shown that RT 23 elicits stronger reactions than RT 22. In other words a smaller concentration is required to elicit the same reaction.

Another change has been introduced in the preparation of tuberculin for pre and post vaccination tests. A stabilizing agent, Tween 80, will in future be added to the fluid used for diluting the tuberculin. This stabilizer will prevent the adsorption of the tuberculin by the glass of the containers and the fairly rapid attenuation of its activity which this produces. The tuberculin dilutions will be more stable and more specific in the reactions they elicit; their activity will be more uniform and the bullous reactions at the injection point will be less numerous.

knowledge of the geographical distribution in Africa is filled by J. Fraga de Azevedo who gives a brief summary of the prevalence of human bilharziasis in the British Cameroons.

Before effective snail-control measures can be introduced it is necessary to know something of the conditions under which the snails live and breed in the area to be treated. On this fundamental subject of the ecology of the snail vectors there are a number of papers. J. Gaud studies the seasonal and climatic factors affecting the life-cycle of *Bulinus truncatus* and *Planorbis metidjensis* in North Africa. B. de Meillon, G. H. Frank & B. R. Allanson discuss some aspects of snail ecology in South Africa. E. Abdel Malek reviews the factors conditioning the habitat of the family Planorbidae particularly in Egypt and the Sudan. H. W. Harry & D. V. Aldrich deal with the ecology of *Australorbis glabratus* in Puerto Rico and J. M. Watson gives a comprehensive account of the ecology and distribution of *B. truncatus* in the eastern Mediterranean countries. In addition notes on snail habitats and their conditioning factors are contributed by F. G. Marill, W. Alves and B. Hubendick.

In his article on the ecology of *B. truncatus* Watson also touches upon the question of the effect of certain types of human activity on the prevalence of bilharziasis—a question that introduces the broader subject of the relationship between vertebrate host, intermediate host and parasite. This subject is dealt with in some detail by F. S. Barbosa & L. Olivier who present the results of studies on the snail vectors of bilharziasis *mansoni* in north-eastern Brazil by A. Buttner who discusses the mollusc schistosome complex in Brazil and by A. V. Martins who reviews the results of experimental studies on non-human vertebrate hosts of *Schistosoma*. Shorter contributions include a brief survey of the animal reservoirs of human bilharziasis in the Eastern Transvaal (R. J. Pitchford), a review of the role of population movements and of human activities in the epidemiology of bilharziasis (J. Gaud), a note on the influence of the living

conditions of the Africans on the incidence of bilharziasis in the Transvaal (R. J. Pitchford), a study on the distribution of *Schistosoma* eggs in human tissues (W. Alves), a discussion of acquired resistance to *Schistosoma* infection in experimental animals (H. Vogel) and an account of some studies carried out on the relation between parasitism and the nutritional state (A. R. P. Walker).

If epidemiological surveys are to give a true picture of the prevalence of bilharziasis and are to yield comparable data, a simple, accurate and uniform diagnostic method must be used. The presence of schistosome eggs in the urine or faeces has been widely used as a diagnostic criterion but it is an unreliable one in the later stages of the disease when elimination of the eggs is rendered increasingly difficult. To solve this problem an immunological test based on the cutaneous response to an injection of an antigen prepared from the cercariae adult worms eggs or miracidia of *Schistosoma* has been developed. J. Pellegrino gives a detailed description of this test covering all aspects from the various procedures for obtaining the basic material for antigen preparation to the skin testing technique and evaluation of the results. Other contributions on the subject of immunology are a short note on the use of the circumoval precipitin reaction as a diagnostic test and as a test for evaluating the results of treatment (R. Rodriguez Molina, J. Oliver Gonzalez & Diana G. Serrano) and a brief review of the results of complement fixation tests in school children after successful treatment (B. de Meillon & E. A. Hollingham).

The next two papers are concerned with snail control by means of molluscicides. W. H. Wright, C. G. Dobrovolsky & E. G. Berry present the results of field trials of sodium pentachlorophenate, copper sulfate and dimethylcyclohexylphenol and E. Paulini contributes a general review of the present status of molluscicidal treatment.

Snail control with chemicals though a valuable temporary measure is too costly to be practical as a single long term method of preventing the transmission and spread of bilharziasis but it will give lasting results.

the island of Leyte Philippines. The aims of the project are to make an epidemiological study of the disease and determine the most effective and economical means of controlling it to study the human domestic animal and snail hosts of *Schistosoma japonicum* and the parasite itself to plan a control programme and to train local professional and auxiliary personnel.

Dr William Alves who has been Director of the Malaria and Bilharziasis Research Laboratory in Salisbury Southern Rhodesia for the past thirteen years has been appointed senior adviser on the WHO team. Dr Alves has worked for WHO as a bilharziasis consultant on several occasions and has served on the WHO Expert Advisory Panel on Parasitic Diseases.

#### Headquarters appointment

Dr Noel Chilton of the United Kingdom has been appointed Chief of the Malaria Technical Intelligence Unit in the Programme Section of the Division of Malaria Eradication recently established at WHO headquarters. In this capacity he will organize the collection and circulation of information on malaria control and eradication and will prepare monthly bulletins on the progress of eradication programmes throughout the world.

Dr Chilton was educated at Oxford and the Medical College of St Bartholomew's Hospital London subsequently specializing in public health and in tropical medicine and hygiene. From 1929 to 1955

he was attached to the Medical Services in Tanganyika where his final post was that of Acting Deputy Director. For the past two years he has been public health adviser at the WHO Regional Office for Africa.

#### Classification of psychiatric disorders

As part of a long term WHO programme for the study of the incidence and prevalence of mental illness Professor Erwin E. Stengel Chairman Department of Psychological Medicine University of Sheffield United Kingdom will shortly start a comparative study of existing classifications of psychiatric disorders. A graduate of the Universities of Vienna and Edinburgh Professor Stengel is President of the Section of Psychiatry of the Royal Society of Medicine.

#### Appointment of PASB Assistant Director

Dr Carlos Luis González of Venezuela, has returned to the staff of the Pan American Sanitary Bureau (WHO Regional Office for the Americas) as Assistant Director. Dr González studied medicine at the Central University of Venezuela Caracas and at Johns Hopkins University Baltimore Md where he obtained the degree of Doctor in Public Health. He first joined the staff of the Pan American Sanitary Bureau in 1953 serving as its Assistant Director from 1954 until early this year when he resigned to take up the post of Minister of Health in Venezuela.

## Review of WHO Publications

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### BILHARZIASIS

*Bulletin of the World Health Organization*  
1958 Volume 18 Number 5-6 (pages 685-1118)

This number of the Bulletin contains some of the epidemiological studies on bilharziasis submitted by WHO consultants to the African Conference on Bilharziasis held at Brazzaville in 1956 together with a number of papers—also prepared for the African Conference—on other aspects of the disease ecology of the vector snails man

snail parasite relationship diagnostic methods snail control human therapy and prevention of spread.

The first article by E. Abdel Malek discusses the distribution of the intermediate hosts of bilharziasis (*Bulinus* and *Biomphalaria*) in the Nile Basin and the Sudan with special reference to the influence of hydrographic and hydrogeological factors. This is followed by a paper on the prevalence of bilharziasis in Swaziland by R. J. Pitchford who also contributes two short notes on the bilharziasis position in Basutoland and Bechuanaland. Yet another gap in the

prevent the re introduction of infection such as the administration of antimalarial drugs to immigrant workers coming from infected areas

The vector of onchocerciasis in Kenya had for a long time defied attempts to eradicate it. The main reason for this was that one stage in its life cycle had escaped notice for it was not until 1950 that the phoretic association between the larvae of *Simulium neavei* and a certain freshwater crab was discovered. This enabled the breeding grounds to be tracked down and the measures subsequently adopted have proved so efficacious that eradication of the fly may now be considered to be practically complete. J P MacMahon, R. B. Highton & H. Goins describe the various stages of the campaign and the techniques used with an indication of the cost of the operations.<sup>3</sup>

Vaccination against whooping cough has now been practised sufficiently long for its efficacy to be beyond reasonable doubt but it is not without its dangers. W. Charles Cockburn discusses the various cases of encephalopathy reported in the literature and assesses the chances of provoking acute attacks of poliomyelitis under certain conditions.<sup>4</sup>

Continuing their studies on dried smallpox vaccine carried out under the auspices of WHO, R. M. Cross, C. Kaplan & D. McClean have tested the efficacy of a vaccine whose potency—measured in terms of the number of infective units per millilitre—had been reduced below the normal value. One year after vaccination the immunity provoked by this material could not be distinguished from that conferred by a more potent vaccine. In addition the level of immunity was the same whether dried vaccine or glycerinated lymph was used.

Research on the virus of trachoma has not progressed as rapidly as that on other viruses. It is difficult to grow in tissue culture and a suitable animal has not yet been found for laboratory studies. In a

detailed review of the subject P. Thygeson discusses the advances in knowledge that have been made despite these difficulties concerning the nature of the virus, methods of culture, the pathogenesis of trachoma and microscopical or clinical diagnosis in the animal.

A paper prepared by R. E. O. Williams in collaboration with other experts deals with the laboratory diagnosis of streptococcal infections, especially infections caused by *Str. pyogenes* which have a tendency to appear in "epidemic" form. A number of techniques and diagnostic tests are recommended. This study is the third in a series on the laboratory diagnosis of various diseases which it is hoped to publish later in monograph form.

Two articles and three notes are devoted to the subject of brucellosis. L. M. Jones discusses methods of preparing nonspecific sera for typing brucella cultures and in collaboration with W. Bruce the same author describes a technique of typing based on a modification of the precipitin reaction in which the antigen is allowed to diffuse into agar plates. The notes deal with immunization against human brucellosis using ether-killed cultures of *Br. abortus* (I. Live), the culture of brucella including fastidious types on a selective medium (L. M. Jones & W. J. Brinley Morgan) and a comparison between veal infusion and trypticase soy broths for the isolation of *Br. abortus* from the blood of cattle (C. A. Manthel, T. E. Amerault & E. R. Goode). The last contribution is a short note describing a method by which it is possible to stain filarial larvae in the body of the insect vectors before dissection (G. S. Nelson).

The list of contents will be found in the advertising section at the end of this number of the Chronicle.

*International Standards for Drinking Water*  
Geneva 1958. 152 pages. Price £1  
\$4.00 or Sw fr 12.—Also published in French.

That water intended for human consumption must be free from chemical substances

<sup>3</sup> A summary of his paper appeared in *Chron. W.H.H. & Org.*  
1958 12, 160.

<sup>4</sup> A summary of his paper appeared in *Chron. W.H.H. & Org.*  
1958 12, 79.

when combined with other preventive measures. One such measure is human chemotherapy—a subject dealt with in an article by D M Blair who reviews the published work on the treatment of bilharziasis with lucanthone hydrochloride and in notes by W Alves and R J Pitchford who discuss the results of mass treatment with the same drug in Southern Rhodesia and in the Transvaal respectively.

Another line of approach is put forward by J N Lanoix. In an article on the relation between irrigation systems and the transmission of bilharziasis he points out that the irrigation engineer can play an important part in checking the spread of the disease by designing irrigation structures in such a way as to avoid creating favourable habitats for the vector snails. A further possibility—the control of vector snails by competition between resistant and susceptible strains—is suggested in a note by B Hubendick.

In the final article in this issue of the Bulletin D B McMullen & H W Harry outline the basic principles to be considered in bilharziasis control drawing attention to the desirability of placing in perspective the various aspects of the problem: health education and sanitation, human therapy and the role of the intermediate and reservoir hosts.

The list of contents will be found in the advertising section at the end of this number of the Chronicle.

## COMMUNICABLE DISEASES

*Bulletin of the World Health Organization*  
1958 Volume 19 Number 1 (pages 1-222)

This number of the Bulletin contains a collection of articles on a small group of communicable diseases: yellow fever, diarrhoeal disease in children, malaria, onchocerciasis, whooping cough, smallpox, trachoma, streptococcal infections and brucellosis.

The Federation of Ethiopia and Eritrea has common frontiers over a distance of 3000 km with countries where yellow fever is endemic or enzootic. Although no authenticated case of yellow fever has ever been

reported in the Federation, serological examinations have from time to time revealed the presence of antibodies in certain members of the population. With the assistance of WHO a systematic epidemiological survey was carried out by the Government in eight provinces aimed at finding antibodies in the population and discovering possible insect vectors. The results are reported by M A Chabaud & M Ovazza. Although the majority of sera examined were negative, a certain number of inhabitants in the province of Assab (Eritrea) appear to have been in contact with the virus the last occasion having been some time between 1951 and 1954. This province contains a zone of yellow fever endemicity and *Culicidae* possible vectors of yellow fever were found in most of the surveyed regions below 2000 metres.

In the countries of the Americas one of the principal causes of death is the group of diseases responsible for diarrhoea in children. L J Verhoestraete & Ruth R Puffer have studied the distribution of the relevant death rates and find that they are correlated with the standard of living, especially with protein deficiency in the diet.<sup>1</sup>

Chemotherapy has been recommended as an adjunct to residual spraying operations in malaria eradication campaigns. In order to ensure that people have a regular intake of the drug in sufficient quantity, its incorporation in ordinary household salt has been suggested. R G Coatney and co-workers report that the administration of chloroquine and pyrimethamine salt mixtures to volunteers has given encouraging results.<sup>2</sup>

Southern Rhodesia is one of the countries where it has been possible to abandon systematic insecticide spraying and to replace it by barrier ring spraying along certain frontiers. To supplement this measure, chloroquine was distributed to the population in some of the peripheral areas. W Alves discusses the results of sample surveys made in the country and the measures taken to

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1958 12 193  
<sup>2</sup> A. mm ry of th p. per pp. dl Ch on Wld Hlth A Org  
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being of the consumer but they render the water aesthetically undesirable for domestic use or cause trouble in the distribution system. The additional chemical substances that provide ancillary indication of pollution are also given. Methods for the analysis of water to detect these chemical constituents of water are given in detail in an annex.

In Part 4 biological requirements relating to studies of water quality including their use in the detection of pollution are discussed in general. Technical procedures are described in an annex. Part 5 on radiological requirements deals with the problem of pollution of water by radiological wastes and the standards of radio activity which may be tolerated in water intended for domestic use. The important question of laboratory services in the control of water quality is also discussed.

*Annual Epidemiological and Vital Statistics*  
1955 Geneva 1958 699 pages Price  
£3 \$12.00 or Sw fr 36— Bilingual  
edition (French and English)

The World Health Organization has just published its eighth annual volume of vital and health statistics containing information

relating to the various countries of the world for the year 1955.

This publication increases in size with each succeeding year and its scope is continually enlarged to permit a more thorough analysis of the various factors influencing public health. Thus the new report running to some 700 pages includes in addition to the subjects usually covered detailed specific death rates by sex and by age for malignant neoplasms classified by their principal sites (lungs digestive organs breast and genital organs lymphatic and haematopoietic tissues). It has been possible to give statistics of causes of death for several countries not previously included and the work also presents for the first time a type of information hitherto unobtainable—namely the distribution of cases of communicable disease by sex and age.

The third part of the volume dealing with the numbers of health personnel with hospital establishments and with vaccination against certain communicable diseases is particularly instructive.

In short this report—to an even greater extent than its predecessors—enables the reader to form an idea of the variety of factors affecting health in different parts of the world.

and micro organisms in amounts which would provide a hazard to health is universally accepted. Supplies of drinking water should not only be safe and free from dangers to health but should also be as aesthetically attractive as possible. Absence of turbidity, colour and disagreeable or detectable tastes and odours is important in water supplies intended for domestic use. The location, construction, operation and supervision of a water supply—its sources, reservoirs, treatment and distribution—must exclude all potential sources of pollution and contamination.

Some countries have established standards of quality which are applicable to their respective areas and have developed a certain degree of uniformity in methods of water analysis and in the expression of the results. Other countries, however, lack official or recognized standards of water quality and have no accredited procedures for the examination of water to assess its quality and safety. During regional and international conferences sponsored by the World Health Organization, the problems of standards of quality for a safe and acceptable water supply and of accredited or approved methods for the examination of water have been fully discussed by groups of expert hygienists and engineers. Great improvement in water quality can be achieved throughout the world if various treatment processes are made easily comparable by the adoption of uniform methods for the examination of water and for the expression of the results. Furthermore, outbreaks of water borne disease could be avoided through stricter control by the responsible water supply and health authorities of the quality of water distributed for drinking purposes. The World Health Organization has therefore published a study on the subject prepared in collaboration with Member States and with the assistance of a number of experts in an effort to offer technical guidance to health and sanitation administrations wishing to revise their regulations on water quality control.

Although this new WHO publication may be of assistance to operators of water supplies and others involved in the treatment

and distribution of water, it is intended primarily for the health authorities whose task it is to ensure that the supplies of water which reach the public are safe and potable. The standards with which it is concerned are the minimum standards of chemical and bacteriological quality required of public supplies of water for domestic use.

Conditions differ widely throughout the world. Some countries are fortunate in having an abundant supply of water from deep wells and underground springs while others must make extensive use of rivers, lakes and other sources of surface water. It is felt, however, that the recommendations made in the WHO study should be applicable whatever the original source of the water or its treatment may be.

The four principal parts of the study deal with bacteriological, chemical and physical, biological and radiological requirements. In Part 2 on bacteriological requirements, consideration has been given to the choice of organisms that should be used as indicators of pollution, to methods that it is suggested should be used for the detection of these organisms, to standards of bacteriological quality that might reasonably be established for communal drinking water supplies, to the frequency with which samples should be taken for bacteriological examination and to the precautions that should be observed in the collection, storage and transport of samples for bacteriological examination. Details of the technical procedures and tables required for computation of most probable number values are included as annexes.

In Part 3 on chemical and physical requirements, attention has been devoted primarily to the limits of concentration for certain toxic substances which may constitute an actual danger to health. Consideration has also been given to the approximate critical concentrations at which other chemical substances may affect the health of the consumer. Chemical substances which affect the quality and acceptability of water have been listed in permissible and excessive concentrations. These substances are not necessarily a menace to the physical well

# BILHARZIASIS

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## Introduction

Distribution of the intermediate hosts of bilharziasis in relation to hydrography with special reference to the Nile Basin and the Sudan—*Emil Abdel Malek*

Bilharziasis in Swaziland—*R. J. Pitchford*

Rythmes biologiques des mollusques vecteurs des bilharzioses: facteurs saisonniers et climatiques influençant le cycle de reproduction de *Bilharzia* et de *Planorbis* en Afrique du Nord—*J. G. d.*

Some aspects of snail ecology in South Africa: a preliminary report—*B. de Meillon, G. H. F. Nkomo & B. R. Allanson*

Factors conditioning the habitat of bilharziasis intermediate hosts of the family Planorbidae—*Emile Abdel Malek*

The ecology of *Austroorbis glabratus* in Puerto Rico—*Harold W. Hargy & David J. Aldrich*

Ecology and distribution of *Bilharzia* in the Middle East with comments on the effect of some human activities in their relationship to the snail host on the incidence of bilharziasis haematobia in the Middle East and Africa—*J. M. Hasso*

Studies of the snail vectors of bilharziasis mansoni in north-eastern Brazil—*Federico S. Barbosa & Leopoldo Oliva*

Le complexe mollusque schistosom au Bresil—*A. B. It*

Non human vertebrate hosts of *Schistosoma haematobium* and *Schistosoma mansoni*—*A. V. Anna Mats*

The intradermal test in the diagnosis of bilharziasis—*J. Pellegrino*

Field trials of various molluscicides (chiefly sodium pentachlorophenate) for the control of aquatic intermediate host of human bilharziasis—*Harold H. Wright, Charles G. D. B. O'Leary & Elaine G. Berry*

Bilharziasis control by application of molluscicides: a review of its present status—*Ernest P. Ulm*

Lucanthone hydrochloride: a review—*D. M. Blai*

Relation between irrigation engineering and bilharziasis—*Joseph N. Lanoux*

Comments on the epidemiology and control of bilharziasis—*Donald B. M. Mullen & Harold W. Hargy*

## Notes

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## CORRIGENDA

Vol 11 No 12

### THE FILARIASES

Page 366 left hand column

*delete* last sentence

*insert* Man is thus the only reservoir of infection in the case of *W bancrofti* but it has been reported that *W malayi* has also been found in various animals

Page 366 right hand column line 15

*delete* parasites

*insert* mosquitos

Page 366 right hand column line 34

*delete* Australia

Page 366 right hand column line 35

*delete* New Zealand

*insert* New Guinea



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# COMMUNICABLE DISEASES

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- Diarrhoeal disease with special reference to the Americas—*Louis J Verhoestraete & Ruth R Puffer*
- Chloroquine or pyrimethamine in salt as a suppressive against sporozoite induced vivax malaria (Chesson strain)—*G Robert Coatney Olaf Mickelsen, Robert W Burgess Martin D Young & Carl I Pirkle*
- Malaria parasite rates in Southern Rhodesia May-September 1956—*William Ahes*
- The eradication of *Simulium neavei* from Kenya—*J P McMahon, R. B Highton & H Goun*
- Incidents et accidents consécutifs à la vaccination antioquelucheuse—*W Charles Cockburn*
- Studies with dried and glycerinated smallpox vaccines of full and diminished potencies—*R M Cross C Kaplan & D McClean*
- The present status of laboratory research in trachoma—*Phillips Thygeson*
- Laboratory diagnosis of streptococcal infections—*R. E. O Williams*
- A recommended method for the preparation of monospecific brucella sera—*Lou M Jones*
- The use of gel diffusion precipitation plates in the study of brucella—*W Bruce & Lois M Jones*

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- Immunization studies on human volunteers with ether killed *Brucella abortus* preliminary report—*I Lie*
- A preliminary report on a selective medium for the culture of brucella, including fastidious types—*Lou M Jones & W J Brimley Morgan*
- Comparative efficacy of trypticase-soy and veal infusion broths for isolating *Brucella abortus* from the blood of cattle—*C A Manthei T E Amerault & E. R. Goode*
- Staining of filarial larvae in insects before dissection—*G S Nelson*

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# PSYCHIATRY AND THE TREATMENT OF DELINQUENCY

*During the past decade the approach to the treatment of criminals and delinquents has not gone unnoted all over the world as well as in medical circles. The emphasis has been placed on their habits and on the influence of the social environment on society as a whole. The law-abiding citizen has been partly replaced by the lawless community. The things of modern psychiatry have been used to shape the new outlook of the modern psychiatrist. The methods of the new psychiatry have been applied in the treatment of delinquency. The article before us has been the topic of a symposium held in London this year to discuss some of the latest trends.*

In view of Denmark's advanced legal provisions for dealing with crime and delinquency and its modern institutions for the treatment of offenders it was fitting that the seminar on the psychiatric treatment of criminals and delinquents organized by the WHO Regional Office for Europe should have been held in Copenhagen. The seminar took place from 28 April to 9 May 1958 and was attended by representatives of 15 countries.<sup>1</sup> They included 23 forensic psychiatrists, 12 general psychiatrists, one child psychiatrist, 6 psychologists, 5 prison directors, 5 criminologists, 3 social workers and one judge.

## Social defence

The attitude to the treatment of criminals and delinquents adopted throughout the discussions of the seminar was based on modern principles of social defence. The traditional approach has been to wait until a crime has been committed and then having caught the criminal to mete out to him a punishment varying in severity according to the gravity of the crime. The punishment satisfied the desire of the community for revenge and was also intended to act as a deterrent. But in fact experience has shown that even severe forms of punishment may have little deterrent value for certain types of criminal and that long sentences protect

society mainly because they deny the offender the possibility of repeating his crimes during his detention.

Modern social defence aims at giving society the maximum protection both by seeking to eliminate the cause of crime and by giving the criminal appropriate treatment to prevent a repetition of his crimes. To this end it is important that there should be adequate collaboration between jurists, psychiatrists, psychologists and members of related professions. Several of the discussions of the seminar centred around the ways in which such collaboration can best be achieved. Although the courts may call on expert opinion in cases where there is doubt regarding the prisoner's mental state the expert's advice is frequently disregarded. Decisions on the fate, treatment and after-care likely to be most effective in restoring the criminal to society call for teamwork between the judge or tribunal and those concerned with the medico-psychological and social examination of the offender prior to his sentence.

## The trial

The concept of social defence does not imply the abolition of punishment nor that the judicial process should be dispensed with. In fact it is considered essential that the individual should realize that he will have to account to justice for deeds that are prohibited by law. It was felt however that the procedure in courts of law should be carefully reviewed from the point of view of

<sup>1</sup> Austria, Belgium, Denmark, Finland, France, Federal Republic of Germany, Italy, Netherlands, Norway, Poland, Sweden, Switzerland, United Kingdom, USSR, and Yugoslavia.

its psychological effect. The process of prosecution and defence of exaggeration and counter exaggeration is likely to leave the prisoner with the feeling that his conduct and his status as a person are not being considered realistically. Indeed the court proceedings may actually have the effect of diminishing his sense of responsibility for what he has done or may make him feel that he is so completely cast out by society that subsequent rehabilitation will be hopeless. In the opinion of the seminar participants trials should be conducted in such a manner as to make it plain that the ultimate interest of the offender as well as that of the community is being considered. The prisoner should be made to feel that the process of rehabilitation has already begun.

### Responsibility

Much discussion was devoted to the subject of responsibility. The approach to this question varies in different countries some recognizing only totally responsible and totally irresponsible offenders others making provision for an intermediate group regarded as only partly responsible for their offences. But all the participants agreed that there were certain mentally abnormal though legally responsible offenders needing special treatment that rehabilitation methods were needed for all criminals and that psychiatry and psychology had a contribution to make to the treatment of normal offenders. It was also recognized that a certain individual sense of responsibility is always present whether the offender is held to be legally responsible or not and even if he is mentally abnormal. This is extremely important from the psychological point of view the fullest possible development of the sense of responsibility being one of the principal aims in the treatment of all criminals.

### The sentence

From the medical point of view the length of the sentence should depend upon the time required to complete the course of treatment rather than upon the gravity of the offence. The fixed sentence rarely suits the psycholo-

gical needs of the offender if it is short—less than a year for example—there is not really sufficient time for treatment if it is long maximum improvement may be attained before expiration of the sentence and further confinement may produce secondary difficulties or a relapse. Many examples were given of the harmfulness of short sentences the interruption of social life and the absence of constructive rehabilitation measures act against the best interests of the offender—and hence also of the community. It was suggested that where short sentences are imposed a start should be made with treatment and that means should be devised for continuing this after the prisoner's release.

In some countries the law permits the passing of an indeterminate sentence enabling the offender to be kept in detention until his improvement is judged to be sufficient to justify his readmission to society. The fact that his release depends upon his own efforts—upon his progress—means that he is placed in a challenging situation of the type he is likely to meet in the outside world. While recognizing this advantage the seminar was unable to reach any final conclusions regarding the relative merits of determinate and indeterminate sentences since the legal systems vary so widely in different countries.

The possibility that jurists, psychiatrists, psychologists and sociologists should collaborate as a sort of treatment tribunal to decide the nature of the sentence and course of treatment was discussed at length but here again no definite conclusions could be reached. It was felt however that in countries which do not provide for detailed investigations before the trial arrangements should be made to defer passing of a sentence after conviction until a thorough psychiatric examination of the offender has been made. This is particularly important where mental abnormality is suspected.

### Treatment

The type of treatment which can be given will naturally depend upon the nature of the institution in which the offender is confined the duration of his sentence and the staff

available. The members of the seminar expressed the view that in special institutions where active treatment is given for mentally disturbed delinquents there should be one psychiatrist or psychologist for every 10 to 30 patients and the ratio of total staff to inmates should be higher than 1:2. In practically every country however there is a shortage of staff for the psychiatric treatment of criminals. It was suggested that where the number of properly trained forensic psychiatrists experienced in the psychotherapeutic method is grossly insufficient it would be more profitable to use them as consultants to the administrators of penal establishments. At the same time it was pointed out that however well trained a psychiatrist may be and whatever qualities of leadership he may possess he is only one member of the therapeutic team working together with the psychologist, the social worker, the educator and other members of the staff. It is important that the criminal himself should also be actively involved as a member of the therapeutic team. Particular reference was made to the use of non-medical psychologists not only for screening, selection and vocational guidance but also in many fields of research in staff training and in personnel management.

The treatment of delinquents and criminals can take place either in penal institutions in special institutions for abnormal offenders in mental hospitals or at liberty. Wherever possible treatment at liberty with the offenders attending as outpatients at psychiatric clinics is the method of choice. Although the proportion of offenders who feel a real need for treatment on their own account is quite small many more will co-operate if given a little persuasion and encouragement. Treatment at liberty offers the advantage that the offender is not cut off from the outside world, his rehabilitation and integration into society are thus greatly facilitated. At the same time this method provides opportunities for investigating the offenders' home background and carrying out active social case work with his family with a view to eliminating unfavourable factors in his environment. Naturally treatment at liberty

cannot be applied to dangerous criminals but a well-developed probation service can do much to reduce the risk of the patient's continuing to commit serious offences without action being taken.

Effective psychotherapy can be carried out in ordinary penal institutions though there are a number of disadvantages. The prison sentence is often felt to be a treatment or punishment exonerating the offender from the need for further action and it is difficult to secure co-operation. The disadvantages of the fixed sentence have already been mentioned. Moreover imprisonment itself may tend to produce character disturbances and much work remains to be done on the possible traumatic effects of repeated imprisonment. The seminar also discussed the potential opposition between punitive measures and psychotherapeutic measures when applied side by side in the same institution. Some participants pointed out that strict security measures could form an obstacle to treatment and could have the effect of making the staff neglect the treatment side of their functions.

Many of the difficulties inherent in treatment in prisons and other institutions can be overcome by practising intensive group therapy along psychoanalytical lines. The value of psychoanalysis was generally recognized by the participants at the seminar but in its original forms it was thought to be too time-consuming for wide application. On the other hand it has provided a sound basis for many of the shorter procedures of psychotherapy and its use as a research tool should not be underestimated. It was emphasized that group methods of treatment must include the possibility of intensive and deep-going procedures. Group therapy provides a small community in which the patient's adjustment can be tested out in real situations. On the other hand unless it can be extended to all the members of the institution it does not wholly overcome the tensions created by singling out certain members for special treatment. This line of reasoning leads to the conclusion that it would be preferable to establish special institutions for treatment by such methods.



its psychological effect. The process of prosecution and defence of exaggeration and counter exaggeration is likely to leave the prisoner with the feeling that his conduct and his status as a person are not being considered realistically. Indeed the court proceedings may actually have the effect of diminishing his sense of responsibility for what he has done or may make him feel that he is so completely cast out by society that subsequent rehabilitation will be hopeless. In the opinion of the seminar participants trials should be conducted in such a manner as to make it plain that the ultimate interest of the offender as well as that of the community is being considered. The prisoner should be made to feel that the process of rehabilitation has already begun.

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### Treatment

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remaining 7 having been transferred to mental hospitals. Of those paroled 18 (12 7/) have relapsed but only 5 (3 5/) have committed new sex crimes. On the other hand of sex criminals detained at Herstedvester who had not been recommended for castration or who had refused operation 50/ had relapsed and two thirds of these had again committed sex offences. The seminar considered it difficult to assess the significance of these figures however. Many of the participants were reluctant to recommend such a mutilating and irreversible procedure and others believed that castration had no place in the treatment of criminals. An alternative method of reducing sexual activity is the administration of oestrogens. Although not satisfactory in all cases it was felt that it could be a useful adjunct to treatment. It was also suggested that more research might be devoted to finding other compounds antagonistic to the male sex hormones but free from the undesirable side effects of oestrogens.

### Role of the prison medical officer

The primary concern of the prison medical officer is the ultimate rehabilitation of the prisoner and he will therefore need to work in close collaboration both with the prison administration and with those who are more directly concerned with after-care. He must be a good general practitioner with an interest in psychotherapy—in fact to some extent a forensic psychiatrist. He must make regular examinations of the prisoners and arrange for the treatment of any reactive psychiatric disorders and he may be called upon to make reports to the courts to advise about sentences and to recommend the placement of convicted prisoners. An important aspect of his work is the creation of the right social and psychological climate in the prison. The prisoners must recognize that he is interested in their welfare and the administration will need advice on such questions as prison regime, prison diet and general regulations. Some of the seminar participants were of the opinion that the prison medical officer should undergo con-

siderable training in psychiatry while others thought this less important and stressed his role as a general practitioner. There was a suggestion that prison medical work should be made a specialty in its own right.

### The forensic psychiatrist

The seminar considered that general psychiatrists too often lack training in forensic psychiatry. It was recommended that the post graduate training of every psychiatrist should include experience in handling and treating delinquents. Stress was laid on the need to develop forensic psychiatry as an independent specialty. It was recommended that university departments of forensic psychiatry should be set up preferably within the medical faculty, the course to include systematic training in individual and group psychotherapy and experience with all types of delinquents, juvenile and adult. Such departments could also provide additional training for general psychiatrists and could organize courses for lawyers, jurists, social workers and psychologists.

### Conclusion

From the general trend of the discussions it was clear that psychiatrists feel they have an important contribution to make to the treatment of criminals and delinquents. As in other fields of mental health many criminal deviations from "normal" behaviour appear to be due to a maldevelopment or breakdown of interpersonal relations. The courts should therefore have expert advice on the personality of the delinquent in order to enable them to decide on the most appropriate "treatment" whether punitive, medical, social or re-educative or any combination of these. In order to arrive at his conclusions the psychiatrist must have access to all the information available but there was a general feeling that he should be protected from the necessity of revealing confidential information to the courts. The existence of legal distinctions between different classes of criminals—for instance between psychopaths and habitual offenders or between respon-

## Special institutions

It was recommended that institutions devoted specifically to the *psychiatric treatment* of criminals should be small and well staffed. It was not considered important whether they fall under the general penal administration or under the mental health services so long as they maintain close contact with the latter. Interesting accounts of experience in two such institutions—the Dr H. van der Hoeven Clinic in the Netherlands and the Herstedvester Prison for Psychopaths in Denmark—were presented to the seminar. Important features of these institutions are that they have been developed in association with laws that permit the indefinite detention of the offender and that an efficient system of after care ensures legal control and a continuation of treatment after the patient has been discharged.

The van der Hoeven Clinic has accommodation for about 100 delinquents and no patient is admitted under the age of 18. Individual and group psychotherapy are given but otherwise the patients are encouraged to lead as normal a life as possible and are given a large measure of responsibility. Regulations for the smooth running of the clinic and the daily programme of activities are drawn up by a Patients Committee on which the various patients serve in turn. There is also a Supervisory Committee which investigates misdemeanours. At first the members of this committee were inclined to impose severe punishments but they were soon persuaded that the more constructive approach was to hear the offender's side of the story to try to discover the reasons for his behaviour and to help him find a way to repair as far as possible the damage done. The committee has since done a great deal of useful work and has won such respect that it is frequently consulted by patients who have done nothing wrong but are simply in distress. There are also a number of subsidiary committees one of which is responsible for handling the financial affairs of the patients. Through serving on these committees the patients gain an insight into administrative methods and learn to appreciate the difficul-

ties that confront the staff. The various programmes organized by the committees—including sports and other spare time pursuits—stimulate healthy and constructive activity—the whole aim of the treatment being to bring out potentialities in the patient and to restore his self-confidence.

The Herstedvester institution has adopted an approach that has been termed *dynamic growth therapy* because it is aimed at starting a process of growth or development that will enable the patient to overcome his need for dependence. The method is based on both group and individual psychotherapy. Affectively charged moments arising out of disciplinary conflicts provide an opportunity to involve the patient in a discussion of the deeper connexions between his present situation and earlier situations of a similar type. It has been found that an intimate knowledge of the case history is of great value in enabling the therapist to provoke the required responses on the part of the patient. In fact the method of anamnestic analysis can itself be used to produce "affective moments". Through helping the patient to understand some of his own strains and tensions the attempt is made to replace the self-devaluation characteristic of the chronic criminal by a more optimistic outlook and to arouse a desire for treatment. As the treatment begins to take effect more of the patient's energies become available for work and spare time activities and group therapy is introduced. Gradually a new pattern of reactions to typical situations is built up but it is important that continuity of treatment should be preserved after the patient leaves the institution. Usually contact is maintained for at least three years and sometimes for much longer.

## Castration and allied procedures

Relatively few countries in Europe permit the castration of chronic male offenders so that experience was insufficient for definite conclusions to be reached. At Herstedvester the operation has been performed on 149 sex criminals during the last 25 years and 142 of these have been released on parole the

drug assays and various biochemical studies. The laboratory must be in a position to examine specimens for parasites and to identify vectors and insect pests. Physiological examinations may be required particularly in connexion with studies on the influence of different types of occupation sports and noxious factors on health. In recent years biophysics has become important for tracing radio activity and the control of microclimates. Finally a function that has also been growing rapidly in importance is the study of epidemiological methods and their application in communicable and other diseases. In all these fields active research should be going on within the laboratory service.

#### Staffing requirements

The Advisory Group devoted considerable discussion to the question of the qualifications and training of scientific staff and auxiliary personnel for public health laboratories. Whereas the director of a central laboratory should hold a medical qualification and have a good knowledge and clinical experience of the diseases connected with the work of the service, the heads of the various specialized departments working under him can be veterinarians, pharmacists or science graduates with special training in their own fields. Each regional laboratory should preferably be in the charge of a microbiologist with a medical qualification. Working under him will be medical or science graduates who have received post graduate training in bacteriology or other specialties with which the laboratory is concerned. They need not be so highly trained as the experts at the central laboratory but will be expected to cover a wider field. Training should be conducted at a well-established public health laboratory with experienced senior staff and during the whole period of training the junior staff should be encouraged to do research independently or as members of a team.

The Group stressed the need to arrange seminars and similar meetings for the senior technical staff of the various public health

laboratories within any country. It is also important for the directors of the central laboratories in the different countries to meet together from time to time. The first such meeting was held in August of this year in Stockholm on the occasion of the International Congress for Microbiology (see page 337).

The training of laboratory technicians is one of the most important tasks of a public health laboratory service as the reliability of the work of a laboratory depends to a great extent upon having competent technicians to do the benchwork. Some countries have had whole or part time schools for technicians for a number of years. They offer a two- to five year course and pupils who pass the final examination receive a certificate. The practical training may be done at the central public health laboratory or at a university department. Some countries have no schools for technicians and in these cases training is given wholly at the public health laboratory.

The Group also discussed the ways in which the staffs of public health laboratory services could be given opportunities for study abroad. These included exchange schemes between individual laboratories, post graduate courses in various aspects of public health laboratory work and individual WHO fellowships. It was suggested that the European Office might study the possibility of encouraging countries to set aside at the central laboratory a sum of money for the salaries of one or two visiting workers.

#### International collaboration

The structure of the public health laboratory service will vary with the needs of the individual country. In some countries there will be only a single central laboratory service, in others a system of regional laboratories and the demands made upon the service will also vary according to the amount of work that can be undertaken in the hospital laboratories. In general however each country will build up a complete diagnostic service and the Advisory Group did not foresee that there would be much

sible and irresponsible offenders—may have little meaning for the psychiatrist. A certain proportion of prisoners regarded as fully responsible will always be in need of psychia-

tric treatment and even in the case of those sentenced to primarily correctional and pedagogic treatment the psychiatrist can play a useful consultant role.

## PUBLIC HEALTH LABORATORY SERVICES

The demand for public health laboratories first arose in the second half of the last century after it had been demonstrated that water, milk and food were capable of spreading disease and were frequently responsible for epidemics. Indeed it was through epidemiological studies that attention was first drawn to the potential dangers of contaminated water and food supplies. With the growth of bacteriology it became possible to devise tests of purity and also to pave the way for routine laboratory diagnosis. As new methods have been developed the functions of the public health laboratories have been continuously enlarged and today they form an indispensable part of any public health service.

For several years WHO has been providing assistance to governments in developing their public health laboratory services and in 1956 an Expert Committee on Health Laboratory Methods was called together to discuss the problems involved particularly in countries just starting their laboratory work and in need of expert advice.<sup>1</sup> In the European Region every country has a more or less well developed public health laboratory service but the rapid advances of the last few years have greatly increased the need for international collaboration and co-ordination. With this in mind the Regional Office for Europe last year convened a meeting of experts to consider the essential services that should be provided by a public health laboratory and to advise on practical measures that might be taken to improve these services within the Region. The Advisory Group met at the Soviet Academy of Medical Sciences in Moscow and the

participants included experts from Denmark, the Netherlands, Poland, Portugal, Sweden, the United Kingdom and the USSR, as well as representatives of WHO.

### Functions of a public health laboratory service

In the past public health laboratories have been concerned almost entirely with the diagnosis, prevention and control of infectious diseases and these are likely to remain their most important functions for some years to come. But the pattern of disease is changing rapidly and the main killers are now cancer and cardiovascular disease. Radio active contamination of the soil and of food and water is a dramatic example of a new threat to the health of the community while air pollution is a danger that has been causing increasing concern for some years. The public health laboratories must be ready to undertake research on these problems and to develop new methods of control. They also have their part to play in studies of school and occupational hygiene and in elucidating the causes of mental ill health.

The basic activities of a public health laboratory embrace a wide range of disciplines. From the first the microbiological and chemical control of food, drinking water, sewage and air has been one of the main functions. Today the microbiologist must also be able to undertake identification of bacteria, viruses and fungi, as well as the preparation of vaccines, sera and antigens for prophylactic, therapeutic and diagnostic purposes and the chemist may be called upon to make toxicological examinations.

and may also handle the notification of infectious diseases. Close co-operation with the executive health service is essential at all levels. To deal with these problems some countries have appointed a special State medical officer either attached to the Public Health Board or as head of the department of epidemiology in the central public health laboratory. In the words of the first report of the WHO Expert Committee on Health Laboratory Methods "Epidemiology provided the original stimulus for the creation of public health laboratories and it is epidemiology which in its turn is providing the laboratories with one of the chief means by which to assess the prevalence of disease and to bring it under control."

As a follow up to the Moscow meeting of the Advisory Group on Public Health Laboratory Services a two day meeting was held in Stockholm at the beginning of August 1958 to discuss the collaboration of public health laboratories in Europe. The members of this second Advisory Group included experts from Austria Czechoslovakia Denmark Finland France Greece the Netherlands Poland Portugal Spain Sweden Switzerland Turkey the United Kingdom and the USSR as well as two representatives of WHO headquarters.

Prior to the meeting a questionnaire had been sent to Member States by the Regional Office and an investigation had been made into the need for an exchange scheme to provide diagnostic antigens to certain laboratories as suggested by the first Advisory Group.

In the questionnaire each Member State was asked to supply *inter alia* a list of the most prominent public health laboratories in the country. After discussing the various replies the Advisory Group agreed that in fact two lists were required—one containing the names of laboratories nominated by the governments to make official contacts with the Regional Office the other listing all the main public health laboratories with information on their special activities such as

blood grouping serology and reference work for other laboratories. Some countries might wish to nominate only one laboratory for the first list others might nominate a separate laboratory for each of the main fields of public health activity.

With reference to the exchange scheme for diagnostic reagents it was considered that the most important antigens were those prepared from the viruses of psittacosis Q fever and tick borne encephalitis the preparation of which entails certain risks and should only be carried out by trained personnel in well-equipped laboratories. At least one laboratory had been found which was willing to supply large quantities of each of these antigens. With regard to payment it was pointed out that only WHO Headquarters and not the Regional Office could provide grants for the preparation of antigens and it was unanimously agreed that in general countries should be prepared to pay for their requirements at an economic rate and make their own arrangements for supplies. Countries which found it impossible to obtain reagents should make specific requests to the Regional Office for assistance—for instance the provision of fellowships for the study of production methods. Apart from the three antigens mentioned above most antigens in common use for laboratory diagnosis are prepared with comparative ease and safety. Several laboratories are probably in a position to supply small quantities of these and it was suggested that the present free exchanges on a personal basis should continue. The Regional Office was asked to prepare a list of laboratories willing to provide laboratory reagents with the conditions under which supplies would be made.

Other topics discussed by the Advisory Group included the training of personnel for work in public health laboratories. It was agreed that it would be useful if the Regional Office would obtain from Member States information on the post graduate training facilities available in each country and circulate it to all Member States. It was recommended that the WHO fellowships scheme should be extended where necessary and the

need for direct collaboration between different countries in the diagnostic field except where methods of examination not yet introduced in one country were already available in a neighbouring country. An example of another type of collaboration is the procedure adopted in venereal disease serology whereby a number of sera were exchanged among different countries and examined by various methods. Comparison of the results enabled the methods to be standardized and provided information on practical aspects of the techniques used in different countries. Attention was also drawn to the international reference laboratories such as the Escherichia Centre in Copenhagen and the World Influenza Centre in London which undertake the typing and checking of uncommon bacteria or viruses and it was recommended that all European countries should take an active part in the use of these facilities.

Another suggestion made by the Group was that a few large laboratories with special experience should be asked to undertake the centralized production of diagnostic antigens and sera and the supply of type strains. This would ensure uniformity and comparability of test results performed by laboratories in different countries and overcome the difficulty still experienced by some laboratories in obtaining diagnostic reagents or strains of infectious agents. It was thought that each manufacturer could supply a group of countries. In some cases one laboratory might be able to produce a certain antigen or serum for the whole of Europe; in others world wide collaboration would be needed.

The Advisory Group suggested that the Regional Office for Europe could give valuable help by providing reagents and strains free of charge to countries unable to pay for them. Rare or dangerous reagents would be supplied only at the direct request of the central laboratory of the country requiring them and countries would be expected to train their own staff to produce the reagents they use most frequently if necessary with WHO assistance. The reagents would be supplied primarily for use in

laboratory research and epidemiological investigations and to a lesser extent for the diagnosis of cases in hospital.

Many countries also experience difficulties in obtaining chemicals, media, apparatus and scientific literature from abroad owing to a shortage of foreign currency. It was suggested that this situation might be improved by means of a European clearance system or that WHO might give financial aid through country programmes. The exchange and distribution of publications among the European public health laboratories should be encouraged. Here the European Office could help by distributing lists of the most important journals on public health laboratory methods. The Office could also act as a clearing house for the exchange of annual reports between countries. These reports sometimes contain minor unpublished technical information which could be of value to other laboratories.

In general international collaboration will be channelled through the central laboratory or group of laboratories. In countries where no central service exists, some other body should be appointed to maintain international contacts.

### Future trends

The WHO international reference laboratories of which mention has already been made at present cover only a fairly restricted number of infectious diseases. It was suggested that similar centres should be set up to follow developments in other fields of public health work such as occupational hygiene and to assist in the development of better methods of study and control. This suggestion is in line with the broadening activities of the public health laboratories and particularly with the increasingly important role that they are playing in epidemiological studies. In many countries the central public health laboratory has a special department of epidemiology possibly with a mobile field unit at its disposal. This department arranges epidemiological surveys, assists in investigating epidemics that have spread beyond the territory of a single authority.

provided during the last 2 or 3 years which are devoted mainly to clinical work. In the southern and central European countries this instruction usually takes the form of lectures with patient-demonstrations in the more northerly parts of Europe it often consists of a few months clerkship<sup>1</sup> during which some lectures are given.

In general the clerkship system appears to be more satisfactory than the lecture system. It is however unsuited to countries where students are many and teachers are few. A clerkship in paediatrics was found to be compulsory or customary for medical students in Finland, the Netherlands, Norway, Sweden and the United Kingdom. This type of training is taken by a minority of students in Belgium, Germany and Switzerland and is about to be introduced in France, Spain and Portugal.

A third system, little practiced in Europe, combines features of both the others. This is the system of group discussion whereby students are taught in small groups and take an active part in discussing and dealing with the problems that arise in the course of their hospital work. An approach to this system is found in France where students are taught in groups during the period of clinical training though instruction is mainly in the form of lectures with patient demonstrations and the groups are quite large.

### Specialized post graduate training

The number of graduates training as paediatricians varies greatly from country to country. In northern Europe there are only a few post graduate students at each centre; at the average southern European centre there are between 30 and 50. One reason for this is that in, for example, the United Kingdom there is little scope for the paediatric specialist except as a hospital consultant and the number of such posts is limited. On the other hand in Italy where the undergraduate medical course is mainly theoretical the private practitioner with

in service training in a specialized branch is at an advantage.

The duration of post graduate paediatric training ranges from between 7 and 10 years in the United Kingdom to 2 years in Italy. The average for Europe is between 3 and 4 years. Full time training is usual in the northern and central European countries and part time training in the others.

The type of basic training given to future paediatricians varies little from country to country since it usually consists of work with both in and out patients at university hospitals, all of which employ the same internationally accepted methods of treatment and examination. However in many cases the range of instruction should be extended to include for example practical experience of laboratory and X ray work. Too much stress is usually laid on clinical paediatrics and not enough on the broader aspects of child care co-operation with child guidance and child psychiatry services being particularly undeveloped. While opportunities for paediatric research are given in a number of centres the over all picture in this respect is far from satisfactory. Another shortcoming is that facilities for training in paediatric surgery in work with newborn and premature children and in the care of communicable-disease cases are often not available in or near the teaching centres.

On qualification the paediatrician is faced with three possibilities: a hospital position, private practice and work as a child health officer. In general the first choice is private practice except in the Netherlands, the Scandinavian countries and the United Kingdom where hospital positions are the rule. In many countries paediatricians combine child health work with their other activities but there is often a tendency—e.g. in Germany and the United Kingdom—to treat paediatrics and child health work as two distinct branches to the disadvantage of both.

### Other post-graduate training

Post graduate paediatric courses for general practitioners and refresher courses for qua-

<sup>1</sup> Clerkship in paediatrics is a period of practical training during which the student is daily reached by the paediatric department in hospital.



direct exchange of laboratory workers between Member States encouraged. A further recommendation was that the Regional Office should collect from the national public health laboratory services lists of the most important

periodicals in which their findings are published and lists of the titles of papers published by members of the services. These lists should be circulated to the various laboratories.

## TEACHING OF PAEDIATRICS IN EUROPE

*It is some 60 years since the teaching of paediatrics as a separate branch of medicine began in Europe. Since then its importance has greatly increased though not to the same extent as in certain other parts of the world where it is now a major subject on the medical curriculum on the same level as internal medicine. Moreover there are wide variations in the range and quality of instruction given at the different paediatric centres. WHO accordingly invited the Executive Board of the International Paediatric Association to co-operate in a study of paediatric teaching in Europe. This joint study was recently published and its main findings are summarized below.*

The study is based on replies to a questionnaire sent out by WHO and the International Paediatric Association (IPA) and on data collected at paediatric teaching centres by a WHO consultant Professor G. M. H. Veeneklaas, Director of the Department of Paediatrics, University Hospital, Leiden, the Netherlands. The text of the study was discussed by representatives of WHO, IPA and the countries which provided data and was revised by a committee appointed by them.

It is estimated that there are some 160 paediatric teaching centres in Europe. As funds for the study were limited it was decided that visits by the WHO consultant should be confined to between two and four representative centres in each of the countries covered and that he should spend an average of one day at each centre. The visits were made during 1955 and 1956 and covered 68 paediatric teaching centres in the following 18 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and Yugoslavia. The

WHO consultant discussed the contents of the WHO/IPA questionnaire with the heads of the centres visited and saw the teaching hospitals.

### Types of centre

Paediatric teaching centres in Europe are of three main types: (a) attached to an independent children's hospital; (b) attached to a general teaching hospital; and (c) housed in a separate building belonging to a group of teaching hospitals.

In the independent children's hospital there is an ever present awareness of the needs of the child as such and this creates the most favourable atmosphere for paediatric training. In the paediatric department of a general hospital this advantage is lost but contact with other branches of medicine is closer. The third type of centre which is by far the most common tends to take after the first or the second type depending chiefly on its distance from the other teaching hospitals.

### Undergraduate training in paediatrics

Undergraduate medical courses in the countries surveyed vary in length from 6 to 8 years. Paediatric instruction is generally

1. Veeneklaas G. M. H. (1957) *Paediatric teaching in Europe*. WHO Monographs, No. 12. S. P. P. VII (F. 5).  
 2. *Review of paediatric teaching in the Americas*. See Ch. 10. *World Health Organization*, 1958, 12, 195.

# DENTAL HEALTH SERVICES FOR CHILDREN

*Diseases of the teeth and the supporting tissues are among the most widespread of the diseases which afflict the child. While the prevalence of dental disease among children of various ages is not uniformly high, it is a serious problem in many countries. The Study Group on Dental Health Services for Children, sponsored by the Belgian Government and the WHO Regional Office for Europe, met in Brussels from 3 to 7 February 1958 to make suggestions for the improvement of dental services in Europe and the development of new dental health services. This article is a summary of the main points of the Study Group report.*

## Prevalence surveys and periodic inspection

As a preliminary to planning a dental health programme for children a survey should be carried out to determine the prevalence of dental disease among children of various age groups in the area where the programme is to operate. This will permit an estimate of the number of personnel required and the approximate cost. The Study Group recommended that the formula "DMF(T)"—number of decayed, missing and filled permanent teeth—be used in recording data. For deciduous teeth the formula "def"—decayed, filled or indicated for extraction—can be used.

In the course of the programme there should be an inspection at least once a year—ideally every six months—to determine the increment of dental disease in the group originally examined. A record should be kept of the age and sex of each child, the clinical condition of the teeth and supporting tissues, the orthodontic condition and treatment given. The Group considered that a uniform system of individual record cards

along these lines should be adopted internationally.

One reason for the present lack of uniformity in data on dental disease is that there is no generally recognized definition of dental caries. The Group suggested the following: "Dental caries may be defined as a defect in the tooth surface that can be clinically diagnosed by the use of a sharp probe and a mouth mirror and which exists in the enamel or in the enamel and dentine."

## Type and scope of services

Various methods of providing dental care for children have been adopted in urban areas. In some cases large central clinics provide special treatment as well as routine dental care. Elsewhere central clinics may be reserved for special treatment, routine care being given at small clinics on school premises or at health centres.

The provision of dental care for children in rural areas is a much more difficult matter. The Group considered that the best solution to this problem is to have fixed or mobile clinics in or near school buildings. Both in urban and rural areas the services of the private dental practitioner are always valuable and in some cases indispensable. For any new programme however the clinic system should be adopted.

In countries with a sufficient number of dentists and adequate financial resources dental health services for children should aim at providing—in addition to complete normal dental care—special care for the handicapped

The participants in the meeting were: Dr M. Th. Dergard, Rotterdam, Belgium; Dr Z. K. Boly, Yugoslavia; Dr Harry W. Bruce, USA (Consultant); Dr Tüherur Bark, Ankara, Turkey; Dr M. Dechaume, France; Dr J. Feijma, Netherlands; Dr D. H. Freshwater, Scotland; Dr S. H. Trive, Belgium; Dr O. M. Joachim, Belgium; Dr G. H. Lea, Germany; Dr D. Macleod, United Kingdom; Dr S. MacNeil, Ireland; Dr W. N. Rucchi, Italy; Dr Kin-dom, Dr S. MacNeil, Ireland; Dr W. N. Rucchi, Italy; Professor J. J. H. Ist, Denmark; Dr Olof K. On, Sweden; Dr W. G. Senior, United Kingdom; Dr V. R. de, USSR; Dr W. G. Senior, United Kingdom; Dr V. R. de, USSR; Dr K. Stranski, Bulgaria; Dr A. Yurkov, Finland; WHO as represented by Dr E. Poulsen, WHO Regional Office for Europe; Mrs R. Repond, WHO Headquarters; Dr C. L. Sebels, WHO Headquarters.

A limited number of copies of this report are available from the WHO Regional Office for Europe, Copenhagen.

lified paediatricians are almost unknown in Europe. One centre in the United Kingdom and two in Yugoslavia however provide regular 3 month post graduate courses in paediatrics comprising lectures, discussions and practical work in hospital wards and out patient departments. In both countries the courses are taken by general practitioners, child health officers and qualified paediatricians.

## Teachers

While it is desirable that the teaching of paediatrics should be a full time job, the professor of paediatrics in Europe usually has so many commitments—e.g. organization, administration, research—that it is impossible for him to concentrate on teaching. This difficulty may be overcome by providing each full time professor of paediatrics with a sufficient number of qualified staff members to take over the administrative side of his work. A start has already been made in this direction, notably in the United Kingdom.

Assistance with the actual teaching is also necessary and this can be provided in various ways. In France for example, part time teaching assistants give bedside lectures in the mornings and do private work in the afternoons; in Germany, full time assistants

teach both undergraduates and trainee paediatricians.

## Paediatric nurses

Most European countries provide training in child nursing and in many of these special paediatric courses are available to qualified nurses. The paediatric centres in northern and central Europe are generally well staffed, but the shortage of paediatric nurses in southern Europe is sometimes acute. It was observed that in a number of paediatric centres the work of the nurse does not receive due recognition and that co-operation between nurses and doctors could be improved.

## Conclusions

An analysis of the data collected on equipment, staff and facilities of the 68 centres covered by the study showed that at least half of them are inadequate for their purpose. Many of their shortcomings are due to social, economic and historical factors and cannot be easily or quickly remedied. Others, however, are dependent on the selection and training of personnel and these should be dealt with first of all. It is recommended that particular attention be paid to the development of paediatric research and co-operation with child health services.

## *Infant nutrition in the tropics*

This is another major medical product of international effort. From his own extensive experience and direct association with other experts and their warm-climate problems, Dr. Jelliffe has compiled an authoritative and fascinating account of the nutritional disorders affecting large segments of the world's younger population. No one in public health—particularly in MCH—can afford to miss this illuminating exposition of problems generic to the entire field. Paediatricians and those in general medicine will be equally rewarded for exploring major segments of this genuine contribution.

Robert W. Hillman in *Medical Times*  
1957 85 225

If it is the best and only by Dr. Jelliffe. (16) 11 H. H.  
O. S. I. T. A. M. & P. S. L. No. 29) P. ce £1.5 \$5.00 o. Sw. f. 15—  
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## Dental health education

Without a well planned continuing programme of dental health education the value of many of the measures advocated by the Group would be lost. For this purpose all known health education techniques should be employed and an international co-ordinating group might assemble and distribute suitable educational material.

It was felt that private dental practitioners as well as public dental officers should play a more important and active part in dental health education. To help them in this task the following facilities might be provided:

(a) post graduate courses sponsored by organized dental groups, governmental agencies or educational bodies

(b) regular information bulletins or news letters from organized dental groups, governmental agencies or other agencies interested in the subject

(c) workshops, seminars and study groups on educational methods and techniques

## Dental training

While realizing that dental curricula in most countries tend to be overloaded the Group thought that more attention might be paid to instruction and training in dentistry for children. No specific curriculum was suggested but it was considered that courses should cover dental health education and preventive services.

# THE CHANGING FACE OF POLIOMYELITIS

The virus disease now known as poliomyelitis was originally called infantile paralysis—a term that for many years was certainly no misnomer since wherever the disease occurred an overwhelming majority of the sufferers were children under five years of age. Its epidemiological behaviour appeared to be characterized by a low annual recorded case rate (10-20 per million), no records of outbreaks of any size and a scarcity of adults and even of adolescents among the victims. This state of affairs prevailed until the late nineteenth century when outbreaks reaching epidemic proportions began to be observed—first in Scandinavia and France, soon afterwards in other parts of Europe and in the early years of the present century in North America. These outbreaks were often distinguished by suddenness of onset and a higher proportion of cases over five years of age than had previously been observed in the areas concerned. They were usually followed by a five to ten fold rise in the five year average case rate. So in some countries what had hitherto been a sporadic affliction of infants quite soon became an epidemic scourge and a serious public health problem. Not all countries, however, were concerned at that

time. While in Europe and North America poliomyelitis was increasing in epidemic severity and tending to attack older and older people in other parts of the world—for instance Central and South America, Africa and the Eastern Mediterranean—it continued to present the characteristic old fashioned picture of so-called "infantile paralysis".

What brings about the transition from endemic to epidemic poliomyelitis? Is there any means of predicting approximately when it is likely to occur? Neither of these questions can as yet be answered categorically but a recent study made in Central and South America<sup>1</sup> by J. R. Paul, Professor of Preventive Medicine at the Yale University School of Medicine, New Haven, Conn., USA, has thrown some interesting light on them.

The close association between the increase in poliomyelitis incidence and modern standards of living has been emphasized repeatedly by modern authors but so far no completely adequate explanation of this phenomenon has been advanced. As Dr Paul points out, it is a highly complex subject and a number

<sup>1</sup> Paul J. R. (1958) Endemic and epidemic trends of poliomyelitis in Central and South America. *B. J. Hyg. Soc. Org.* 19 (in press)

(e.g. children with orthopaedic disabilities) the correction of malocclusion of the teeth and jaws and treatment for cases with cleft lip and cleft palate. The programme should also cover pre school children and expectant and nursing mothers and should include preventive measures and dental health education.

Unfortunately few countries have sufficient resources for a programme of this type. Where there is a shortage of trained staff and finances are limited the programme should concentrate on children cutting their first permanent molars i.e. the 6 year old group. Older children should come next followed—when resources permit—by very young children and expectant or nursing mothers. Priority should be given to preventive measures the relief of pain and the removal of gross oral sepsis.

The Group considered that where possible provision should be made for both general and specialized orthodontic services. The aim of orthodontic treatment in a dental service for children should be to secure a reasonably satisfactory result rather than perfection in every case.

### Preventive measures

The general factors predisposing to diseases of the teeth and supporting structure are believed to be faulty diet and metabolism as well as certain systemic conditions. Particular attention should be paid to the diet of expectant or nursing mothers; this should be supplemented or fortified if it is unbalanced or if some essential vitamin or trace element is missing.

Local measures of prevention are too numerous to list in detail. The following should however be taken into account in a dental health programme for children.

(a) *Diet* Foods which have a detergent action (e.g. apples or celery) are indicated as well as those which increase the flow of saliva. Any excess of carbohydrates should be avoided.

(b) *Oral hygiene* This includes such measures as the brushing of the teeth the use of floss silk and where there are abnormal

conditions of the gum the use of a wooden point or gum stimulator. Periodic visits should be paid to the dentist for the removal of dental plaques stains and deposits.

(c) *Topical applications of fluoride solutions* These are of proven value in making the teeth more resistant to caries.

The report of the WHO Expert Committee on Water Fluoridation<sup>3</sup> concluded that there was ample evidence to support the belief that this method of prevention renders the teeth more resistant to dental caries and that its safety as a public health measure has been proved beyond doubt. In the light of these conclusions the Group considered that in areas where water supplies are deficient in fluorides water fluoridation should be an essential part of programmes of preventive dentistry. Should this measure prove impracticable fluoride tablets may be used provided they are taken regularly and strictly in the quantity prescribed.

The Group recommended further research on killing or inhibition of oral bacteria adjustment of the balance of micro organisms in the mouth and reduction of the number of caries producing organisms neutralization of acids formed in the mouth the value of toothpastes containing sea water concentrates stannous fluorides ammonia urea compounds and antibiotics the value of supplementing the diet with vitamin B<sub>1</sub> and B<sub>2</sub> preparations as well as fluoride compounds the collagen structure of tooth and bone and the use of synthetic sugars which are non fermentable in mouth fluids.

The Group also stressed the importance of preventive orthodontics i.e. the early recognition and correction of conditions predisposing to malocclusion of the teeth and jaws. For example the crowding of permanent teeth due to the premature loss of deciduous teeth could in most cases be prevented with little expenditure of time or money. Other examples of preventive orthodontics are the correction of harmful habits such as finger or thumb sucking and the judicious planned extraction of teeth to correct overcrowding.

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Without a well planned continuing programme of dental health education the value of many of the measures advocated by the Group would be lost. For this purpose all known health education techniques should be employed and an international co-ordinating group might assemble and distribute suitable educational material.

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While realizing that dental curricula in most countries tend to be overloaded the Group thought that more attention might be paid to instruction and training in dentistry for children. No specific curriculum was suggested but it was considered that courses should cover dental health education and preventive services.

# THE CHANGING FACE OF POLIOMYELITIS

The virus disease now known as poliomyelitis was originally called "infantile paralysis"—a term that for many years was certainly no misnomer since wherever the disease occurred an overwhelming majority of the sufferers were children under five years of age. Its epidemiological behaviour appeared to be characterized by a low annual recorded case rate (10-20 per million), no records of outbreaks of any size and a scarcity of adults and even of adolescents among the victims. This state of affairs prevailed until the late nineteenth century when outbreaks reaching epidemic proportions began to be observed—first in Scandinavia and France, soon afterwards in other parts of Europe and in the early years of the present century in North America. These outbreaks were often distinguished by suddenness of onset and a higher proportion of cases over five years of age than had previously been observed in the areas concerned. They were usually followed by a five to ten fold rise in the five year average case rate. So in some countries what had hitherto been a sporadic affliction of infants quite soon became an epidemic scourge and a serious public health problem. Not all countries however were concerned at that

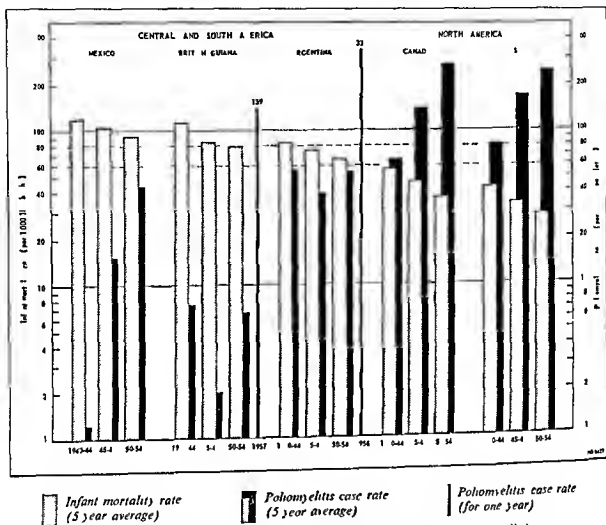
time. While in Europe and North America poliomyelitis was increasing in epidemic severity and tending to attack older and older people in other parts of the world—for instance Central and South America, Africa and the Eastern Mediterranean—it continued to present the characteristic old fashioned picture of so-called "infantile paralysis".

What brings about the transition from endemic to epidemic poliomyelitis? Is there any means of predicting approximately when it is likely to occur? Neither of these questions can as yet be answered categorically but a recent study made in Central and South America<sup>1</sup> by J. R. Paul, Professor of Preventive Medicine at the Yale University School of Medicine, New Haven, Conn., USA, has thrown some interesting light on them.

The close association between the increase in poliomyelitis incidence and modern standards of living has been emphasized repeatedly by modern authors but so far no completely adequate explanation of this phenomenon has been advanced. As Dr Paul points out it is a highly complex subject and a number

<sup>1</sup> Pa. J. R. (1958) Endemic and epidemic trends of poliomyelitis in Central and South America. *Bull. World Hlth Org.* 19 (1 press)

5 YEAR AVERAGE INFANT MORTALITY RATES (PER 1000 LIVE BIRTHS) AND POLIOMYELITIS RATES (PER MILLION) IN THREE COUNTRIES IN CENTRAL AND SOUTH AMERICA AND TWO IN NORTH AMERICA 1940-54



The horizontal one outlined by the dotted lines indicates what might be called a critical infant mortality one

of factors may come into play. First for example there is the simple fact that hand in hand with higher standards of living goes improvement in case finding and reporting which naturally leads to an increase in the recorded rate. Secondly with poliomyelitis as with several other virus diseases infantile infections are apt to be the mildest of the clinical forms so that a very high proportion (over 99%) of infants who become infected with polioviruses fail to develop any symptoms which would attract the attention of

physicians—a fact that would account for the low case rate of the infantile disease. Thirdly one of the results of better living conditions is that children who would otherwise have become infected with polioviruses in infancy may reach the age of 8-12 years before being exposed to the infection with two consequences: (a) not having acquired immunity through a subclinical attack early in life these older children are more likely to develop the severer readily recognizable forms of the disease when they do eventually

encounter the virus and (b) an increasing proportion of the juvenile population will grow up non immune and will so to speak become riper each year for an epidemic.

Turning then to the second question—can the transition from endemic to epidemic poliomyelitis be predicted in a given country?—Dr Paul explains that a fair idea of when it is likely to occur can be obtained from a study of the infant mortality rate i.e. the number of deaths in the first year of life per 1000 live births. An earlier comparison by Dr A. Payne, Chief of the Endemic-Epidemic Diseases Section at WHO Headquarters, of the infant mortality rates and the poliomyelitis case rates in several European and North American countries over a number of years had revealed the interesting fact that the rates of the disease usually increased as the infant mortality rate decreased and that the primary explosive outbreaks of the disease often occurred soon after the infant mortality rate had fallen to

below 75. Dr Paul has examined the corresponding rates and epidemic incidents for certain Central and South American countries where the transition has only comparatively recently been observed and has found that by and large the inverse ratio between infant mortality rates and poliomyelitis case rates is holding there also (except in the island communities where the polio-viruses are presumably less easily introduced). The recent epidemic episodes in these countries have more often than not been associated with an infant mortality rate of between 60 and 80 and the author therefore feels that a watchful eye should be kept on the poliomyelitis case rate in any country once the infant mortality rate has fallen within this range since a sudden and devastating upsurge of the disease may be about to occur—an upsurge that could probably be prevented by starting a vaccination campaign at the first signs of a significant rise in the case rate.

## HOOKWORM DISEASE IN SYRIA

In several of the countries of the Eastern Mediterranean area ancylostomiasis (hookworm disease) is a serious threat to public health—among the helminth diseases second in importance only to bilharziasis. Particularly heavy infestations occur in some parts of Syria, mainly in the coastal strip and along the banks of the Orontes and the Euphrates.

The disease saps the vitality and affects the health of whole communities; it also predisposes to other serious diseases such as tuberculosis. Intestinal haemorrhage leads to a microcytic hypochromic anaemia which may be very severe with a haemoglobin level below 30% and a red cell count of 2 million per mm<sup>3</sup> or less. Such cases usually occur in poor undernourished communities and the impaired working capacity still further increases the poverty. It is therefore important to map out the areas of high endemicity and to decide what measures can be taken to combat the spread of the disease.

In October 1955 the WHO Regional Office for the Eastern Mediterranean re-

quested Dr H. F. Nagaty, Professor of Parasitology at the Ein Shams University, Cairo, to undertake a survey of ancylostomiasis in Syria. The following is a brief summary of his methods and findings which have already been published in detail elsewhere.<sup>1</sup>

### Methods

Investigations were carried out in all nine governorates of Syria as well as at El Kayem in Iraq a few miles from the Syrian frontier. There is frequent traffic across the frontier in this area which adjoins Deir Ez Zor Governorate where hookworm infestation is particularly heavy and it was thought that similar conditions might exist in the El Kayem district of Iraq. In fact 59% of the boys and 27% of the girls at two local schools were found to have ancylostomiasis.

Altogether examinations were carried out on 4211 persons, rather less than 10% of the



population of the villages surveyed and about 0.1% of the total population of Syria. As the men were usually scattered in the fields during the day they could not easily be reached. Even when found they generally refused a stool sample on some pretext or other. The women could not be asked in deference to local customs. Dr Nagaty therefore confined his investigations almost entirely to schoolchildren who were easily accessible and from whom with the help of the schoolmasters the necessary samples and data could be obtained in a short time. Children are also a very sensitive index of the presence of helminthiasis in a community as they are careless in their habits and less resistant to the parasites.

Stools were examined by the direct smear method: two smears being made on each slide. One smear was emulsified with water and the other with iodine solution. Another smear was prepared by the Erlenmeyer floatation method using filtered concentrated salt solution. Towards the end of the survey which lasted altogether three months the direct smear method was abandoned and only the floatation method used. Stoll egg counts for *Ancylostoma* were made in some cases in endemic zones to give an idea of the intensity of infestation. A search was also made for other helminths and occasionally for protozoa. At Deir Ez Zor some of the boys with ancylostomiasis were subjected to a more thorough investigation in hospital including differential blood counts. The worms were collected and identified as *Ancylostoma duodenale*. Treatment was given with tetrachlorethylene.

## Results

The most prevalent worm disease was ascariasis which was found in 46% of all subjects examined. Ancylostomiasis came next in importance with an attack rate of 24%. The highest rates for this disease were found in Deir Ez Zor Governorate where the average rate for the whole territory was 47%. In many of the schools however 85-100% of the children were suffering from hookworm disease. The infested villages

were found along both banks of the River Euphrates. The only other area where ancylostomiasis was prevalent was Hama Governorate with an overall rate of 43% but the disease was restricted mainly to two villages on the banks of the River Assi. The governorates of Hasaka and Aleppo had attack rates of 3% and 2% respectively while no cases at all were found in any of the remaining five governorates.

Other fairly common helminths were *Trichocephalus* (19%), *Hymenolepis nana* (11%) and *Trichostrongylus* (4%). Infestation with *Trichostrongylus* was particularly prevalent in Deir Ez Zor Governorate where as many as 43% of the inhabitants of one village were affected. Some 45% of the subjects examined were infested with one species of parasite only, 26% with two species, 5% with three species and 0.5% with four or more species. Only about a quarter of those examined were found to be free from worms.

## Discussion

Hookworm disease occurs only in areas where no proper latrine facilities are provided and where people habitually go about barefoot. This is the case in most of the rural areas of Syria—and 75% of the population live in rural districts. The villages are scattered over wide areas and the houses are without latrines of any sort. The schools too are very often without latrine facilities. Defecation and urination take place in open fields. Most of the villagers go about barefoot although children usually wear some kind of footwear to school. The warm moist conditions found in Deir Ez Zor and Hama Governorates are particularly favourable to the development of the hookworm larvae. Although these governorates do not have much shade and direct sunlight is inimical to the development of the larvae the people usually seek out a fairly shaded secluded spot for defecation.

A simple measure that would control the spread of hookworm disease would be the compulsory wearing of sandals or some other form of shoe out of doors. Apparently a law to this effect does exist in Deir Ez

Zor Governorate but it is not enforced. Apart from protection of the feet attention should also be given to preventing the continuous pollution of the soil by providing all houses and schools with latrines. Where such a measure would be too expensive public latrines might be a satisfactory alternative. Dr Nagaty considers that disinfection of faeces or soil is too difficult and expensive to be applied over large areas.

Besides these hygienic precautions mass treatment of the entire population should be carried out in areas where an appreciable number of cases have been detected, all members of the community being treated within a short period of time. With modern drugs it is possible not only to give immediate relief to the patient but also to reduce the number of eggs reaching the soil and thus cut down the rate of reinfestation. Never-

theless since some reinfestation does occur and a single treatment is scarcely ever sufficient to eliminate all the worms it is necessary to repeat the treatment at suitable intervals. Supplementing the diet with additional proteins and with iron is in itself sufficient to reduce the severity of symptoms and to enable the patient to build up a resistance by increasing the production of gamma globulin.

Wherever financial resources permit these measures should be applied simultaneously. At the same time efforts should be made to improve the living standards of the population particularly with regard to sanitation and to educate the public by means of extensive health propaganda. Finally Dr Nagaty emphasizes the need for strengthening the health services including the school medical services.

## *Epidemiological and Statistical Information*

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### RECENT DATA ON MORTALITY FROM ALCOHOLISM

Although it is well known that alcoholism constitutes a serious public health problem it is almost impossible to discover its exact magnitude by means of vital statistics. Even in the most highly developed countries morbidity statistics on a nation wide basis are practically non-existent but at best they could only be of limited value when applied to alcoholism.

The only statistical data on the subject at present available relate to mortality and are far from giving an accurate picture of the situation. The number of deaths directly attributed to alcoholism cannot in fact reflect the true mortality for the consumption of alcohol may be at the root of many other diseases or violent deaths (accidents, suicide, homicide etc.). Following the rules of classification it is generally these diseases or causes of violent death that are taken into account for the purpose of mortality statistics, alcoholism being considered only as a

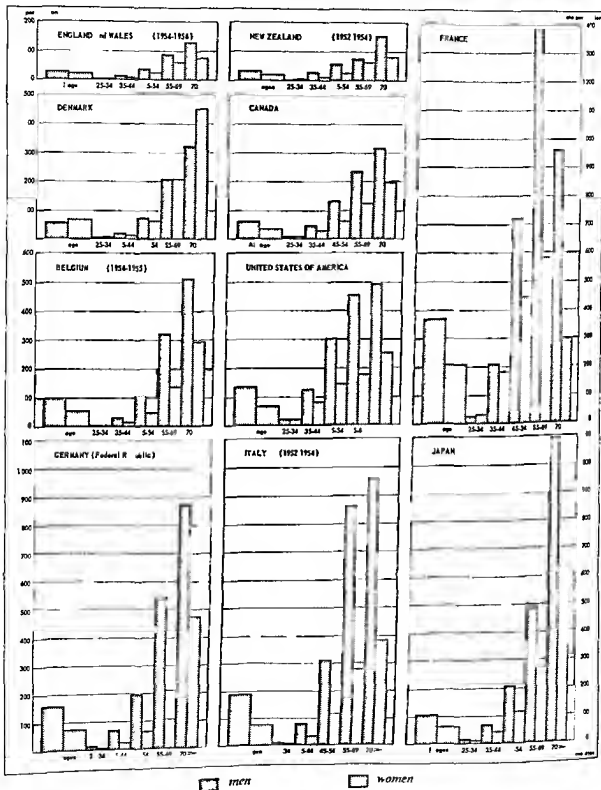
contributory factor. To be of real value the statistics must include the number of deaths to which alcoholism is a contributory factor as well as the number of deaths of which it is the primary cause.

The data on alcoholism recently published by WHO in its *Epidemiological and Vital Statistics Report*<sup>1</sup> must therefore be considered only as a rough guide; they do not permit comparisons to be made between one country and another but are useful in that they indicate the general trends during recent years in certain countries. The figures are supplemented by data concerning mortality from cirrhosis of the liver—a disease which is of course often related to alcoholism.

It may be said that during the last few years the mortality from alcoholism (ie

<sup>1</sup> *Epidemiol. vital Stat. Rep.* 1958, 11, No. 4. See also *Epidemiol. vital Stat. Rep.* 1956, 9, No. 3.

MORTALITY RATES (PER MILLION) FROM CIRRHOSIS OF THE LIVER IN CERTAIN COUNTRIES  
BY SEX AND AGE GROUP 1953 1955 \*



Exc pt wher th rw se stat d

alcoholism properly so-called and alcoholic psychosis) has remained more or less stationary in most countries. In France however a continual rise was noted (from 6.2 per 100 000 inhabitants in 1950-1952 to 10.6 in 1955) while in the United States the rate has constantly declined (from 1.7 per 100 000 inhabitants in 1950-1952 to 1.3 in 1955). On the other hand deaths from cirrhosis of the liver (with or without mention of alcoholism) have tended to increase. In France for example mortality from this disease rose from 19.7 per 100 000 inhabitants in 1950-1952 to 31.9 in 1956. Austria, Belgium, Germany, Japan, Portugal and the United States are among the countries in which a similar increase has been noted although the respective rates vary widely.

Mortality is considerably higher among men than among women (three to four times as high with respect to alcoholism and about twice as high for cirrhosis).

Deaths from alcoholism and cirrhosis are mainly in the older age groups. Mortality from alcoholism is highest between the ages of 40 and 69, after which it decreases slightly. Mortality from cirrhosis of the liver increases gradually with age, the highest rates being reached above 65 or 70 years.

The accompanying figure shows mortality rates from cirrhosis of the liver in various countries by sex and age group. It should be noted that mortality from cirrhosis generally accounts for something like 70-80% of all deaths reported for cirrhosis of the liver and alcoholism together.

## Notes and News

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### Difficulties in the use of DDT wettable powder

In April of this year it was reported from Iran that large quantities of DDT wettable powder received there appeared to be far below WHO specifications. The material was lumpy, failed to suspend easily and tended to clog up the sprayers. Specimens sent to New York for testing were, however, found to comply fully with WHO specifications. Two experts—one from UNICEF which had supplied the powder and one from WHO—accordingly went to Iran to investigate the matter on the spot.

It was found that although the powder met WHO specifications, precautions had to be taken in preparing the suspension. The tendency to lump was due to two factors: (i) a reduction in the amount of anti-caking agent in the formula, (ii) the removal of most of the air from the material as a result of vacuum packing.

Thus the fact that certain batches of DDT water-dispersable powder contain lumps and suspend less easily than others does not necessarily mean that they are of inferior quality. The lumps can be broken up fairly easily by hand (rubber gloves should be

worn) or with a flat paddle. If they are allowed to stand in water for about an hour before final dilution, they will break up of their own accord. Spraymen should always be reminded to shake the compression sprayer frequently to keep the wettable powder in uniform suspension.

### Non proprietary names for pharmaceutical preparations

The increasing number of new pharmaceutical preparations put on the market every year creates many problems. National drug control authorities, laboratories and research workers dealing with the examination and testing of new drugs should have the necessary specifications as soon as possible, together with other information which will permit the classification of these drugs for distribution and sale. When the chemical formula of a preparation is too complicated, there is also need for a shorter designation, preferably formed by a combination of syllables indicating the significant chemical groupings of the compound or its pharmacological classification or both.

In accordance with its Procedure for the Selection of Recommended International Non Proprietary Names for Pharmaceutical Preparations<sup>1</sup> WHO has already proposed 628 non proprietary names for important new medicinal substances with the co operation of national authorities and manufacturers in a number of countries. The Sub Committee on Non Proprietary Names of the WHO Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations met at the end of September to examine and propose names for a number of recently introduced pharmaceutical preparations. Objections to names formerly proposed were considered as well as suggestions from national authorities and manufacturers for amendments to the General Principles for Guidance in Devising International Non Proprietary Names<sup>2</sup> adopted by WHO.

The names proposed by WHO are finding acceptance in a large number of countries. Six lists of proposed international non proprietary names have been published by the Organization<sup>3</sup> and a further list is expected to appear shortly.

The following experts were invited to take part in the meeting of the Sub Committee on Non Proprietary Names: Professor H. Baggesgaard Rasmussen (Denmark), Mr T. C. Denston (United Kingdom), Professor R. Hazard (France), Professor Eugenio Sellés (Spain), Dr R. T. Stormont (USA), Professor V. Zakusov (USSR), Mr P. Blanc (WHO) acted as Secretary to the Sub Committee.

### Cholera and yellow fever vaccines

The WHO Study Group on Recommended Requirements for Biological Substances which met in Geneva from 1 to 6 September has formulated requirements for cholera and yellow fever vaccines. These recommended requirements deal with control measures during manufacture as well as tests of the finished products and contain technical descriptions of recommended methods of

assay. If the requirements for cholera vaccine are widely adopted the exchange of cholera vaccines between different countries will be greatly facilitated.

The UNRRA Standards for the Manufacture and Control of Yellow Fever Vaccine have been in operation since 1945. In 1957 the WHO Expert Committee on Yellow Fever Vaccine proposed revised manufacturing and testing requirements<sup>4</sup> these have been used by the Study Group as the basis for its recommendations.

The following experts were invited to take part in the meeting of the Study Group: Dr M. L. Ahuja (India), Dr J. Gallut (France), Dr D. C. Lahiri (India), Dr O. Maaloe (Denmark), Dr F. N. Macnamara (Nigeria), Dr R. Panthier (France), Dr W. L. M. Perry (United Kingdom), Dr Margaret Pittman (USA), Dr V. L. Troitzsky (USSR), Dr J. Wolff (Netherlands), Dr N. K. Jerne (WHO) acted as Secretary to the Study Group.

### Joint WHO/FAO Expert Committee on Zoonoses

The report of the Joint WHO/FAO Expert Group on Zoonoses which appeared in 1951<sup>5</sup> dealt in detail with bovine tuberculosis, anthrax, psittacosis, hydatidosis and Q fever. The Joint WHO/FAO Expert Committee on Zoonoses met in Stockholm in August to review advances in knowledge of these diseases since the publication of the Expert Group's report and to discuss several other zoonoses. The following aspects of salmonellosis were considered: animal reservoirs, the epidemiology and control of food borne salmonellosis, and the role of the WHO Salmonella Centres. The epidemiology of leptospirosis and the classification of *Leptospira* organisms were also discussed. The Committee considered the revision of the list of zoonoses published in the report of the Joint WHO/FAO Expert Group on Zoonoses and in a joint meeting with the WHO Expert Committee on Respiratory Virus Diseases reviewed the part played by animals in the epidemiology of influenza.

See Ch. 14, H. H. O. G. 1958, 12, 109  
See Ch. 14, H. H. H. O. G. 1958, 12, 111  
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WHO H. H. H. O. G. 1958, 12, 111

The participants in the Expert Committee's meeting were Professor M Abdussalam (Pakistan) Dr B D Blood (Pan American Zoonoses Center) Dr W C Cockburn (United Kingdom) Dr E C Chamberlayne (PASB/WHO) Sir Thomas Dalling (FAO) Dr E A Eichorn *Secretary* (FAO) Dr M M Kaplan *Secretary* (WHO) Dr R M Mendy *Vice Chairman* (Argentina) Dr K F Meyer *Chairman* (USA) Professor J A R Miles *Vice Chairman* (New Zealand) Dr J Muller (Denmark) Professor J Parnas (Poland) Dr A W Stableforth, *Rapporteur* (United Kingdom) Professor K Wagener (Germany) and Professor J W Wolff (Netherlands) Dr J H Steele (USA) acted as WHO consultant for the meeting

### Mental health problems of old age

In some of the more highly industrialized countries increased life expectancy and the reduction in the size of families have greatly complicated the problem of caring for the aged. In particular there has been an alarming increase in the number of old persons admitted to mental hospitals. With improved standards of living a similar situation threatens to develop in countries where as yet only a small percentage of the population survives into old age.

The WHO Expert Committee on the Mental Health Problems of Ageing and the Aged met in Geneva in September to review the causes and types of mental illness in old age and consider ways of dealing with the problem. The members of the Committee were Dr E Braga (Brazil) Professor A Querido (Netherlands) Dr A Repond (Switzerland) Dr C A Roberts (Canada) Professor Torsten Sjögren (Sweden) Professor A V Snezhnevsky (USSR) Dr Tigani el Mahi (Sudan). WHO was represented by Dr E E Krapf and Dr Maria Pfister who acted as Secretary. Professor Martin Roth (United Kingdom) acted as consultant to the Committee.

### Accidents in childhood

In many countries accidents are responsible for more deaths among children over

one year old than all other causes of death combined. For each of these accidents that proves fatal there may be a hundred or so others many of them resulting in permanent disfigurement or disability. While much has been done towards the prevention of traffic accidents—still the cause of a high proportion of deaths in childhood—less attention has been paid to accidents in the home which in some countries account for about half the number of accidental deaths and injuries among children. Education legislation and safety devices are the principal means of preventing accidents. To minimize the effects of those that do occur efficient first aid hospital and rehabilitation services are needed.

A seminar on the prevention of accidents in childhood sponsored by the WHO Regional Office for Europe and the Belgian Government was held at Spa, Belgium in July to consider these and related problems. The principal subjects discussed were mortality and morbidity due to childhood accidents in Europe, the relationship of accidents to the nature of the child, safety measures, co-operation between agencies concerned with accident prevention among children, education and publicity, legal administrative and medical aspects. An exhibition of publicity material and safety devices designed to prevent common childhood accidents was held in connexion with the seminar and a number of films from the various countries represented were screened for the participants.

Twenty one European countries were represented at the seminar by experts in a wide variety of fields including health, police, work, education, town planning and public information. Representatives were also present from WHO and from four non-governmental organizations, namely the Association for the Aid of Crippled Children, the International Children's Centre, the International Federation of Senior Police Officers and the League of Red Cross Societies.

### Susceptibility of insects to insecticides

A seminar on the susceptibility of insects to insecticides was held in Panama from

23 to 28 June under the auspices of the Government of Panama and the Pan American Sanitary Bureau (WHO Regional Office for the Americas). There were 83 participants from countries and territories throughout the Region. The topics discussed included the genetic biochemical and ecological aspects of resistance and standard methods for testing levels of susceptibility in insects of public health importance.

The report of this seminar including the papers presented and the full transcript of the discussions will shortly be issued in mimeographed form by the Pan American Sanitary Bureau.

#### **Regional seminar on leprosy control**

The development of the sulfone drugs which can arrest or retard leprosy in the individual and prevent its transmission to others has revolutionized the treatment of leprosy and kindled new hope in victims of the disease. One important result of this development is that literally millions of hidden cases are coming to light.

Although generally speaking leprosy is less prevalent in the Americas than in parts of Asia or Africa it is an important health problem for a number of countries and territories in the Region. A seminar on leprosy control was held by the Pan American Sanitary Bureau (WHO Regional Office for the Americas) and the Brazilian Government at Belo Horizonte State of Minas Gerais Brazil from 30 June to 7 July. It was attended by some 40 eminent public health workers including leading authorities on leprosy from 16 countries and territories in the Region. The purpose of this meeting was to consider the results of isolation in the control of leprosy and of newer control methods to review mass treatment programmes and methods of prevention and to make recommendations on the organization of mass leprosy programmes and their integration in the public health services. The participants supplied information on the leprosy problem in their respective countries including data on the geographical distribution of the disease control measures employed and legislative measures in force.

#### **Health precautions for the Mecca Pilgrimage**

Recent smallpox and cholera outbreaks in India, East Pakistan and Thailand have led health authorities in the Eastern Mediterranean Region to strengthen the control measures applied to Mecca pilgrims.<sup>1</sup>

On the occasion of the 1958 Pilgrimage which ended on 30 June every pilgrim arriving in Saudi Arabia was required to produce a certificate of double inoculation against cholera (two doses of vaccine administered at an interval of one week). The health authorities of the United Arab Republic notified WHO that during the Pilgrimage season all ships and aircraft carrying pilgrims or travellers from Saudi Arabia had to land at El Tor Quarantine Station while all passengers leaving the Province of Egypt by land or sea for the Hedjaz had to be in possession of valid smallpox and cholera vaccination certificates.

The effectiveness of these and other prophylactic measures has been confirmed by the fact that this year's Pilgrimage was free from pestilential disease. A similar success was recorded last year when the Mecca Pilgrimage was free from all contagious disease apart from a few cases of Asian influenza.

#### **Malaria eradication plan for India**

The Government of India has decided in agreement with WHO to convert its national malaria control programme into an eradication programme which will be the largest ever undertaken for a single country. Some 230 eradication units—each intended to give protection to a million people—are to start spraying operations this year in all the endemic areas of the country. In 1959 and 1960 these operations will be extended to hypo endemic areas in which autochthonous transmission of malaria cannot be completely ruled out and where a further 160 million persons will be protected.

It is expected that spraying can be completed by 1961 and the plan provides for

surveillance to be maintained for three years afterwards. During the eradication campaign each year's progress will be critically reviewed at an annual conference attended by all officers in charge of units.

### Cholera outbreak in Nepal

At the request of the Government of Nepal WHO has supplied 25 000 doses of cholera vaccine to help immunize the population of Khatmandu where an epidemic has broken out. This is the first cholera epidemic to be reported in Nepal since the beginning of the century.

The cholera situation in Asia is the most serious in many years. By the end of July a total of 48 722 cases and 20 685 deaths had been reported in India, East Pakistan and Thailand, and cases had also been recorded in Cambodia and Burma.<sup>1</sup>

### Tuberculosis surveys in Africa

With the co-operation of WHO case finding teams surveys are being carried out in various parts of Africa in order to assess the prevalence of tuberculosis and to determine how its prevention and treatment can best be undertaken in the countries and territories concerned. The system used is generally that of random sampling and the methods of examination include tuberculin testing, sputum examination and if suitable equipment is available X-ray examination.

The data collected are sent to the WHO Tuberculosis Research Office in Copenhagen for evaluation.

During 1957 and 1958 4200 persons were examined in Ghana. In Nigeria the towns of Lagos and Ibadan have been surveyed in the latter 1600 people were examined and the survey was continued by a local team after the WHO staff left. In Freetown, Sierra Leone, two groups of schoolchildren and 1500 other inhabitants were examined.

The largest tuberculosis survey in Africa is now taking place in Nairobi, Kenya, where it is planned to examine the whole African population of the town—i.e. between 120 000 and 140 000 people—in the space of two years. Those affected by pulmonary tuberculosis will be treated immediately so as to avoid further contagion. As a preliminary to the mass campaign a sample of about 12 000 people is being examined in order to assess the prevalence of the disease. To undertake the survey the Government of Kenya has appointed 2 medical officers, a public health nurse and 35 auxiliaries headed by a supervisor; they will be assisted by a WHO team consisting of 2 medical officers, a laboratory technician, a bacteriologist and a public health nurse. UNICEF is providing X-ray and laboratory equipment, vehicles and drugs to a value of some \$147 000.

WHO teams are also carrying out tuberculosis surveys in Uganda and Mauritius and it is planned to send similar teams to Nigeria, Basutoland and Bechuanaland in the near future.

<sup>1</sup> See *Isis Chron. Wld Hlth Org.* 1958 12, 210.

## People and Places

### Organization of medical stores

Although WHO does not supply organizations it is interested in the proper organization of medical stores and in measures to facilitate the supply of medicines and medical equipment to hospitals and health services. In 1952, WHO sent M. J. E. Williams, of the United Kingdom, to Ceylon for two years to assist the Government in the organization of a medical supplies service for all hospitals and clinics throughout the country. This service has been functioning ever since and Mr Williams has just paid a second visit to Ceylon to review its progress.

M. Williams is Supplies Officer to the United Bristol Hospitals, and a member of the Pharmaceutical Society of Great Britain. In 1957 he served WHO on an assignment to Afghanistan similar to those he has undertaken in Ceylon.

### Nutrition and dental health

Several rural communities near Kaohsiung City, Taiwan (China), have been found to be almost completely free from dental disease and deformity although the fluoride content of their drinking water is low. In Kaohsiung City itself, however, there is a high prevalence of dental caries.



At the request of the Taiwan Government a WHO expert—Dr B Lilienthal—will investigate the relationship between the prevalence of dental disease in the Kaohsiung area and the diet of the inhabitants. Dr Lilienthal is a Senior Research Fellow of the National Health and Medical Research Council of Australia and is at present working at the Institute of Dental Health in Sydney. He is both a dentist and a biochemist and has done considerable research in the field of dental caries.

#### Nursing education in Taiwan

Since 1952 a WHO team has been helping the health authorities of Taiwan (China) to improve their nursing education programme. The team is attached to the National Taiwan University School of Nursing at Taipei.

The latest member of the WHO team is Miss Helen Fillmore of the United States who will assist principally with the teaching of obstetrics and paediatric nursing. Miss Fillmore has had experience as a staff nurse, supervisor and teacher and has received post basic training in paediatric nursing and in maternal and child health.

#### Toxic hazards in spraying programmes

WHO has started an enquiry into the toxic hazards to which spraymen are exposed during dieldrin spraying programmes. In this connexion Dr Wayland J Hayes Jr of the United States will visit spraying programmes in Africa, India, Indonesia, Iran and Iraq to study spraymen at work under field conditions and make recommendations for their future protection.

Dr Hayes is Chief of the Toxicology Section of the Technical Development Laboratories, Communicable Disease Center, US Public Health Service, Savannah, Ga., and has taken part in the work of the WHO Study Group on Toxic Hazards of Pesticides to Man.

#### Health statistics unit in India

A demonstration and training unit in health statistics was established in Nagpur, India, with WHO

assistance in March 1956. Its aim is to show how statistics can help health departments in their work, and to serve as a training centre for health statisticians.

Dr Wallis Taylor of the United Kingdom is at present in Nagpur as WHO statistician with the task of advising on the work of the unit. A graduate of the London School of Economics, Dr Taylor has been Lecturer in Economic and Social Statistics at the University of Exeter, England, since 1955.

#### WHO Headquarters

Dr A W A Brown, Biologist Division of Environmental Sanitation, has returned to Canada to resume his post as Head of the Department of Zoology, University of Western Ontario.

During his two years' service with WHO, Dr Brown contributed to the development of co-ordinated world wide research on insecticide resistance, collecting and circulating information on the subject from 135 laboratories and almost 450 scientific workers. He also established standard methods for testing the insecticide susceptibility levels of adult and larval mosquitos. Dr Brown's monograph *Insecticide Resistance in Arthropods*, published by WHO early this year<sup>1</sup> is probably the most thorough survey of the insecticide resistance problem that has yet been made.

Dr Brown's successor is Dr Don W Micks who has been granted a one year leave of absence from his post as Assistant Professor of Medical Entomology at the University of Texas Medical Branch. Dr Micks obtained his B.Sc. and M.Sc. degrees at North Texas State College, subsequently studying at the Johns Hopkins University School of Hygiene and Public Health where he took his S.D. in parasitology, specializing in medical entomology. For the academic year 1953/4 he was granted a Fulbright Research Award to the Istituto di Zoologia, Università di Pavia, Italy, where he studied the *Anopheles gambiae* complex of Europe from the biochemical point of view. After his year at WHO Headquarters, Dr Micks will return to the University of Texas Medical Branch as Professor of Medical Entomology.

<sup>1</sup> *Wild Health* O. G. M. 1958 N. 38

## Review of WHO Publications

*Bulletin of the World Health Organization*  
1958 Volume 19 Number 2 (pages 223  
400)

In the third and last part of their report on the WHO assisted pilot project for the control of bilharziasis japonica in the Philippines T. P. Pesigan and co-workers deal with control measures employed in Leyte Province where the terrain is unsuitable for the application of molluscicides. These included the removal of vegetation in and around infested streams drainage of water logged areas the filling or flooding of low lying areas and the digging of fishponds in sluggish streams. Experiments carried out in rice fields harbouring large numbers of snails showed that improvements in rice growing methods markedly reduce the snail population as well as increasing the rice yield. The role of sanitation in the control of bilharziasis is also discussed.

H. van der Schalie describes a pilot study in the control of the snail vectors of bilharziasis which was carried out in Qalyub Egypt in 1953-54. Although the area selected for the study was thoroughly surveyed and treated with copper sulfate the snails were not completely eliminated. Moreover the high cost of copper sulfate would preclude its widespread and continual use as a molluscicide. Nevertheless until long term bilharziasis control measures—such as improved sanitation better treatment facilities and health education—can be perfected the author considers that snail control is of the first importance and that determined efforts should be made to find cheaper and better means of effecting it.

P. Antonipulle, H. V. David and M. D. R. Karunaratne contribute a paper on *Taeniorhynchus (Mansonoides) uniformis*, the chief vector of rural filariasis in Ceylon. To control this mosquito residual spraying of DDT was carried out in a village on the west coast of Ceylon. It was found that

the insecticide retained its effectiveness for 4-6 months. The paper includes observations on the behaviour of the mosquito.

The next paper by E. Mosna, L. Rivo-secchi and K. R. S. Aseher gives the results of a cytological examination of the larvae of a normally susceptible and a dieldrin selected strain of *Anopheles atroparvus* both laboratory reared. A very high proportion (77.4%) of heterozygous inversions was observed in the larvae of the 28th generation of the dieldrin resistant strain whereas the proportion in the normally susceptible strain was only 20.8%.

D. S. McLaren has made an extensive study of the literature on protein malnutrition with special reference to the frequency of involvement of the eyes. He reviews the available evidence which suggests that this important complication is nearly always the result of an accompanying vitamin A deficiency.<sup>1</sup>

R. R. Puffer and L. J. Verhoestraete contribute a preliminary analysis of data on mortality from cardiovascular diseases in various countries. Wide geographical variations are noted and it is suggested that there is room for improvement in the recording and interpretation of statistics on cardiovascular mortality.

An international collaborative assay of material for the Third International Standard for Oxytocin, Vasopressor and Antidiuretic Substances is described by D. R. Bangham and M. V. Mussett. It has been decided that the potency of the new Standard should be expressed as 20 International Units per milligram.

W. H. A. Schödtler describes an investigation into the possibility of supplying stable consistent and reproducible batches of snake venom for adoption as international reference preparations for antivenin sera. Experiments with venom samples from the South American

snake *Bothrops jararaca* showed that the toxic potency of venom samples from snakes of the same species collected in different localities may vary significantly. The author concludes that stable and unvarying batches of venom can probably be obtained only from snakes bred and kept in captivity under constant environmental conditions.

Taking recent trends in England and Wales as his starting point G. Tooth writes on the place of the psychiatric hospital in a mental health service.<sup>2</sup>

Finally there is a bibliography covering literature published in 1957 on the toxicity of pesticides to man and animals. This is the second annual supplement to the bibliography published in Vol. 16 No. 6 of the Bulletin. The first annual supplement appeared in Vol. 17 No. 3.

The list of contents will be found in the advertising section at the end of this number of the Chronicle.

#### VENEREAL INFECTIONS AND TREPONEMATOSES

*Bulletin of the World Health Organization*  
1958 Volume 19 Number 3 (pages  
401-588)

At the end of the Second World War the prospects for controlling venereal disease and the allied treponematoses with penicillin seemed remarkably good and indeed improved almost annually as new preparations were developed permitting easier administration and longer effective retention in the circulation. The opportunity was seized by public health authorities the world over and mass treatment campaigns which were undertaken in areas where such infections were endemic met—and are still meeting—with a success undreamt of fifteen or twenty years ago. Endemic syphilis, bejel, yaws, dichuchwa, yaws and pinta have all responded to treatment as have countless cases of sporadic syphilis and gonorrhoea.

However while the treponeme continues to show an apparently unabated sensitivity to penicillin and the world reservoir of syphilis has shrunk dramatically over the last decade two phenomena have occurred which are causing some anxiety—the increasing number of severe reactions following penicillin administration and the apparently reduced sensitivity of the gonococcus to that drug. It therefore seemed opportune to present in this issue of the Bulletin an up to date review of the situation prepared by T. Guthe, O. Idsoe & R. R. Willcox so that public health authorities and others might have to hand as complete as possible a compendium of knowledge on which to base their policies.<sup>2</sup>

The advent of penicillin was particularly propitious for the treatment of gonorrhoea for the sulfonamides on which such hopes had been pinned but a few years previously were already beginning to prove ineffective in large numbers of cases owing to the preponderance of resistant gonococcus strains which had built up. As R. R. Willcox points out in another article in this issue no strain was resistant to penicillin at the outset and no strain is now completely resistant to it. But there is evidence from many parts of the world (Dr Willcox deals mainly with experience in England) that a relative resistance or reduced sensitivity is being acquired. The preparations producing prolonged but low levels of penicillinaemia are no longer giving good results and higher serum levels are now required. The question naturally arises whether we are again approaching the serious situation which confronted venereologists as the sulfonamides gradually lost their power. Fortunately as Dr Willcox points out there are today a number of effective alternatives to penicillin in other antibiotics; moreover it is very probable that a complete resistance to penicillin should it occur at all would not develop for many years to come. There is no doubt however that the situation is one which demands close vigilance especially among certain population groups which for

various reasons may be at particular risk as is clear from a separate note by Dr Wilcox on treatment failures in certain minority groups in Great Britain

The decreasing sensitivity of the gonococcus to penicillin is also touched on by T Guthe in the first article in this issue where he discusses another important aspect of venereal disease control—prevention—putting forward a plea for establishing venereal disease control programmes on a considerably broader foundation than is usual at present Y Tanami & J Yamamoto in another article describe the control measures now applied in Japan and the extent of the venereal disease problem there Another facet of prevention in Japan is presented by T Ohno and his co-authors in a note on the prophylaxis of venereal disease in Japanese prostitutes by the use of vaginal foaming tablets of antibiotics T H Wong & P N Wang report on the prevalence of venereal infections in prostitutes and similar groups of women in Taiwan

It has become apparent in the course of the mass treatment campaigns against the trepo-

nematoses conducted in so many countries in the past few years that the techniques used for giving intramuscular injections vary quite considerably from area to area—and not always to the good as certain areas have been observed to suffer from a higher number of local abscesses than others C J Hackett & C W Göckel have therefore prepared a summary of the recommended techniques and procedures for intramuscular injection with a view to providing a useful guide to those engaged in mass campaigns

Serological aspects of venereal disease control are also considered in this issue of the Bulletin R. H. Allen & D. B. Tonks study the relation of the chemical structure of phosphatides in cardiolipin antigens to reactivity in the VDRL and Kolmer tests H. Schmidt & M. W. Bantz report on investigations as to the sensitivity of a recent serological test for syphilis (the Rapid Plasma Reagin test) in which plasma is substituted for serum

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# BULLETIN

DE  
L'ORGANISATION MONDIALE DE LA SANTÉ

OF  
THE WORLD HEALTH ORGANIZATION

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An evaluation of techniques used in estimating snail populations—*Nelson G Hairston Bengt Hubendick John M Watson & Louis J Olivier*

Vector snail control in Qalyub Egypt—*Henry van der Schalie*

Biology and control of *Taeniorhynchus (Mansonoides) uniformis* Theobald the chief vector of rural filariasis in Ceylon—*P Antonipulle H V David & M D R Karunaratne*

Studies on insecticide resistant anophelines 1 Chromosome arrangements in a field strain of *Anopheles atroparvus*—*E Mosna L Rivoecchi & K R S Ascher*

Involvement of the eye in protein malnutrition—*D S McLaren*

Mortality from cardiovascular diseases in various countries with special reference to atherosclerotic heart disease a preliminary analysis—*Ruth R Puffer & Louis J Verhoestraete*

Third International Standard for Posterior Pituitary (re named Third International Standard for Oxytocic Vasopressor and Antidiuretic Substances in 1956)—*D R Bingham & Marjorie V Mussett*

Reference toxins for antivenin standardization—*W H A Schottler*  
The psychiatric hospital and its place in a mental health service—*Geoffrey Tooth*

## *Bibliographical section Section bibliographique*

Toxicity of pesticides to man and animals (1957)

Toxicité des pesticides pour l'homme et les animaux (1957)



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## MATERNAL AND CHILD HEALTH IN THE DEVELOPING COUNTRIES

*As the experience accumulated in the national public health organizations, the emphasis has been placed on the stock taking and evaluation. A recent session of WHO and UNICEF was specifically addressed by Dr. Jes. M. B. M. N. P. of the Ministry of Health, University of California School of Public Health, and former Chief of the Maternal and Child Health Service of WHO Headquarters. In a paper presented to the American Public Health Association in November 1957, the following conclusions were drawn from the adaptation of the D. B. M. paper to the best possible method of delivery by WHO and UNICEF. It is a general recommendation that the maternal and child health services be approached by kind people in the American Journal of Public Health, which published the D. B. M. general paper in July 1958.*

### Training of personnel

From the beginning both WHO and UNICEF have placed a high priority on assistance in the training of personnel. From 1947 to 1956 WHO awarded 601 fellowships for study abroad of various aspects of maternal and child health covering public health training with major emphasis on maternal and child health courses in child health and puericulture, paediatrics and obstetrics and periods of observation of various maternal and child health services. In 1956 fellowships in this branch were awarded to 71 physicians and 21 nurses who came from 44 countries or territories and studied in 27 countries.

To help countries to establish and improve their training facilities WHO assigns international personnel to work with the governments and UNICEF provides the needed equipment, supplies and transportation to the training institutions with stipends for certain categories of personnel.

WHO gives three main types of within country assistance in maternal and child health. First of all some 40 demonstration and training projects have been established in 9 countries for each of these. WHO has provided a team consisting of a medical officer and one or more public health nurses

and midwives. These teams help to organize demonstration units which give orientation and refresher courses to professional maternal and child health personnel as well as training auxiliary health workers. In a second type of training project experienced nursing and midwifery tutors have been provided to help 34 countries to establish new training institutions or to improve existing ones. Thirdly assistance in developing the teaching of paediatrics has been given to medical schools in 11 countries. In all three types of project the country provides counterpart personnel who work with the international staff and carry on when the latter are withdrawn. Short term consultant services in various aspects of maternal and child health are also made available by WHO. In 1956 maternal and child health and such related activities as nursing, midwifery and nutrition services accounted for roughly a quarter of WHO funds expended in the assisted countries.

Large numbers of auxiliary personnel such as assistant midwives, nurses and sanitarians have been given short periods of simple training so as to hasten the provision of minimum maternal and child health services. As a result thousands of new maternal and child health centres have been established especially in rural areas. UNICEF has provided equipment, dried milk, vitamin



supplements and drugs for the centres as well as transportation for supervisory personnel and kits for nurses and midwives. From 1953 to 1957 more than 40 countries were helped by UNICEF in this way.

Despite the fact that many thousands of health workers have been trained and are helping millions of mothers and children in newly established health centres and in their homes, only a small proportion of the population in many countries benefits even from minimum maternal and child health services. Moreover, services everywhere need to be improved and extended. This can be done only in so far as the numbers of adequately trained professional workers increase and the governments are able to establish and maintain posts for supervisors, consultants, instructors and programme directors. It must be remembered that internationally assisted health projects constitute only a very small part of the total effort being made by the governments which are striving to bring about improvements in many fields.

### *Improved leadership*

The growing interest of the assisted governments is demonstrated by the number of maternal and child health units they are setting up in their national health administrations. Of the 53 countries which have had assistance from WHO in this field, 28 have now established such units or intend to do so shortly. Twelve of them were established between 1953 and 1957. The greatest progress in this respect has been in South East Asia.

Although all these units are as yet inadequately staffed, it is encouraging to note that in each region there is at least one physician at the top planning level whose principal responsibility is maternal and child health. WHO has now made provision for nine permanent posts for maternal and child health advisers at this level: two at headquarters, two in the South East Asia Region and one in each of the remaining regions. Six of the seven advisers so far appointed have had wide experience in international health work and most have served in more than one

region. Furthermore, the maternal and child health assistance projects in the various countries are increasingly benefiting from the services of international personnel who have had previous experience in developing countries and from the work of trained national staff.

### *Some requirements for progress in the future*

Improved leadership in the assisted countries and the building up of a cadre of seasoned staff in WHO and UNICEF are essential for progress in the future, which will be measured not only in terms of numbers of personnel trained and of services established but in terms of the results achieved in reducing the major health problems of mothers and children in the assisted countries. This means that the somewhat empirical approaches of the past must be replaced by more precise methods. It will be necessary to devote more study to the nature and extent of maternal and child health problems and possible resources for dealing with them. Comprehensive data on mortality and morbidity and on the prevailing endemic diseases affecting mothers and children will have to be obtained for each area. More specific information on growth and development patterns of children, feeding practices, beliefs and traditions concerning child bearing and child rearing—all are needed to provide a better basis for sound programme planning and to give the necessary base line information for the evaluation of future progress.

Observation of present practices in many areas has revealed the need for reorienting existing service and training programmes and for developing new approaches better suited to the needs and resources of the assisted countries. Too much effort has been expended in setting up prefabricated programmes which are ill suited to the situation. This reflects both the inexperience of international personnel in dealing with the problems of developing countries and the inadequacy of much of the training received by national staff at home and abroad. Only the scientific principles of public health practice in the more developed countries are universally applicable, not the programme patterns.

Both international and national personnel in positions of leadership need a thorough knowledge of epidemiological methods as applied to maternal and child health work and an efficient approach to programme planning. They also need to understand the influence of socio-economic and cultural factors on the patterns of health and disease and on measures for health improvement. To realize the vast differences that exist in levels of socio-economic development one need only compare infant mortality rates in the developing countries with past rates in the more developed countries. Sweden has the longest series of data on vital statistics going back to 1750<sup>2</sup> when her infant mortality rate (i.e. the number of deaths in the first year of life per 1000 live births) was in the neighbourhood of 200. Similar or even higher rates still prevail in a number of countries in Africa and the Eastern Mediterranean Region. Between 1810 and 1875 Sweden's rate fluctuated around 150—the present-day rate in much of Asia. By 1900 the Swedish rate was around 100, the figure currently reported by a number of countries in Central and South America.

The poor economic and social situations and the resulting health problems in many countries today are probably similar to those which prevailed in the past in the more developed countries. D. B. Jelliffe<sup>3</sup> has pointed out that while the importance of the exotic tropical diseases should not be minimized, present-day health problems in the developing countries are due more to the persistence of such non-exotic factors as inadequacy or absence of excreta disposal, squalid overcrowded housing and inadequate contaminated water supplies, all of which lead to an endless succession of parasitic and infectious diseases. To these must be added the pervasive effects of undernourishment and malnutrition and the tenacious influence of cultural factors on the whole pattern of living.

## Programmes must be broad in scope

In areas with high prevalences of malnutrition and of endemic and epidemic disease maternal and child health programmes must be broad in scope and prepared to deal with the general health needs of mothers and children as well as with the special needs relating to the reproductive and growth processes. Children under the age of 15 and women of child bearing age constitute over 60% of the population in developing countries. Because of their natural appeal services for mothers and children are usually among the first permanent health services to be established. They offer a particularly effective starting point for preventive services and individual health education and form a nucleus around which family health services, sanitation and disease control programmes can be developed. Much attention is being devoted to integrating existing maternal and child health services into general health programmes particularly in Asia and to incorporating maternal and child health in newly developing health programmes as in Latin America.

## Use of resources in maternity care

In most developing countries puerperal sepsis and haemorrhage are the principal causes of maternal death. Sepsis results from the unskilled ministrations of the traditional birth attendants who deliver most babies. Haemorrhage is related to the almost universal prevalence of anaemia among women of child bearing age. The nature and etiology of the anaemias require more study but from available evidence it seems likely that a major cause is a shortage of iron and proteins in the diet<sup>4, 5</sup> while intestinal parasites also play a role. Furthermore many of the women suffer from various endemic and epidemic diseases common to the community. In such circumstances it appears that the best use of the resources would be

<sup>1</sup> L. J. D. N. (1954) *For all Infants and early Childhood*. New York (C.N. & N. on P. Publications No. 13).

<sup>2</sup> Eastman, N. J. (1954) *The working of obstetrics and gynaecology as preventive medicine*. 1. *International Congress of Gynecology and Obstetrics Geneva*.

<sup>3</sup> Woodruff, A. W. (1955) *Brit. med. J.* 1: 197.

1 To establish a simple training course for the traditional birth attendants in which they would be taught how to avoid introducing infection into the birth canal and the cord area of the newborn to bring their patients to the health centre for pre natal care to recognize serious complications and to refer them for treatment. A course of this kind helps the attendants to feel that they are members of the health centre team and makes them willing to accept supervision. UNICEF has been assisting such efforts by providing training stipends for the attendants and delivery kits for those who complete the training course and are found to be reliable.

2 To concentrate in the pre natal clinics on the vigorous treatment of anaemia on nutrition and on health education. Because of the high prevalence of anaemia and under nourishment iron therapy and supplemental feeding will be offered routinely to all patients thus saving the time which would be required to perform haemoglobin estimations. Anthelmintic therapy will also be given according to a prescribed routine because ascariasis is prevalent. Physical signs and the history of previous pregnancies will help the workers to decide if other measures are needed. Nutrition education with emphasis on iron and protein containing local foods should be carried out in the centres and the women's homes. These are important not only for improving the mother's health and that of the foetus but in helping to ensure successful lactation upon which the baby will have to depend for some months after birth.

In the circumstances outlined the other usual routines of pre natal and maternity care are of secondary importance. Where the needs are so great and the resources so limited as they are in the developing countries it is distressing to find the midwife devoting most of her time to routine attendance at confinements and the remainder to routine pre natal procedures focused on the pregnancy rather than the patient while the use of UNICEF iron tablets and other dietary supplements and drugs is neglected. This situation reflects the inadequacy of traditional training in midwifery. The train-

ing of all categories of maternal and child health personnel needs to be reviewed in the light of requirements in the field: the recruits available, the types of personnel needed and their utilization on the job.

### Services for infants and young children

In nearly all assisted countries services for children have received less attention than those for mothers. In fact the interest of the staff and the availability of services tend to decrease as children grow older so that the child of pre school age is to a great extent neglected. This is particularly unfortunate since in the countries concerned the major preventable health problems—undernourishment, malnutrition, intestinal infections and communicable diseases—begin during the weaning period and continue to be prevalent through the second and third years of life.

In countries reporting infant mortality rates of about 100 or higher the ratios of neonatal mortality (deaths under one month of age) to post neonatal mortality (deaths between 1 month and 1 year of age) are generally about 1:2 rising to as much as 1:4 in those with the highest infant mortality rates. In countries where rates have fallen well below 100 the ratios are in the order of 1:1 and only where the rates have reached 35 or below do the neonatal mortality rates exceed the post neonatal rates. In the circumstances there seems to be little justification for concentrating services on the neonate at the expense of the older infant and young child.

L. J. Verhoestraete has pointed out the sharp contrasts in mortality rates between the developed and less developed countries: these are particularly great in the case of children 1-6 years of age.<sup>6</sup> Some countries report about as many early childhood deaths as infant deaths.

While there are no figures on morbidity it is interesting to speculate on the amount of illness there must be among infants and children in the less developed countries. In an unpublished memorandum K. Sinclair Loutit has calculated for different case

fatality rates how many cases of illness must occur among infants in countries with high infant mortality rates. In a country with an infant mortality rate of 100 there would be among 1000 infants up to 27 new cases of minor illness (case fatality rate of 1%) daily or 10 000 cases a year. For diseases with a case fatality rate of 10% there would be up to 1000 cases a year. In countries where the infant mortality rates are 200 or 300 these figures would of course be doubled or trebled.

The amount of illness among young children is likewise staggering. Severe malnutrition reaches its peak prevalence during the early childhood years. About 85% of diagnosed cases of protein malnutrition occur in children 1-3 years of age.<sup>7</sup> The dangers from other nutritional disorders and from enteric infections and intestinal parasites are also greater in early childhood than during the first year of life when the infant receives milk in his diet and enjoys a greater degree of protection from an environment full of hazards. The nutritional and enteric diseases responsible for the major share of deaths among young children are all preventable through improved nutrition, sanitation of the environment and the education of mothers in child care. In these circumstances

well-child services and those limited to infants have little meaning. What is needed are programmes combining therapeutic and preventive care focused on the common endemic diseases and continuing throughout infancy and early childhood.

### Training in paediatrics and nutrition

In developing countries the training of all health workers—from physicians to auxiliaries—has been particularly weak in paediatrics and nutrition. Recognizing this fact both WHO and UNICEF have taken steps to call attention to the importance of paediatric training and to provide more assistance in this field. Two surveys of paediatric education assisted by WHO have recently been completed in Latin America and in Western Europe. A WHO Study Group

on Paediatric Education was convened in 1956 to consider ways of improving the teaching of paediatrics with special emphasis on the developing countries.<sup>8</sup> The UNICEF Executive Board has decided to extend its assistance to medical schools so as to enable them to expand and improve training programmes in paediatrics and preventive medicine. In the plans being developed jointly by UNICEF and WHO the newly established or enlarged paediatric departments will serve as focal points for research in child health and for the teaching of paediatrics to nurses and midwives as well as to physicians. They will provide refresher courses for maternal and child health personnel as well as post graduate training for teachers and supervisors of field programmes.

Consideration is being given by WHO in co-operation with UNICEF and the Nutrition Division of FAO to various means for increasing the effectiveness of nutrition education in maternal and child health centres and including nutrition courses in the training of all health workers.

The problem of enteric diseases among children has been the subject of epidemiological studies and regional conferences in Latin America.<sup>9</sup> Similar activities are planned for other areas. Field investigations are now being carried out to determine whether health workers with minimal training and facilities can be successfully taught the techniques of oral rehydration. If they can the lives of many infants and young children suffering from severe enteric infections could be saved.

### Services for children of school age

Although there is as yet very limited provision of health services for children of school age in the developing countries interest in this field is growing. In this as in other aspects of maternal and child health it is impossible to envisage comprehensive programmes for some time to come. Unfortunately the beginnings have often consisted of attempts to provide medical inspection

tions before there have been any real possibilities for follow up and corrective care. In these circumstances the inspections become perfunctory routines of little real value.

A more realistic approach now being stressed takes advantage of the unequalled opportunities which schools offer for health education. By enabling children to experience living in a healthy environment and by giving practical health teaching with emphasis on sanitation, nutrition and the transmission of disease, schools can correct the false ideas about health that are passed on from one generation to the next.

The starting points are teacher education in health and the provision of sanitary latrines and safe water supplies in schools and teacher training institutions. Ways for improving the health education of teachers are currently being studied by WHO in

collaboration with UNESCO. It is hoped that UNICEF assistance may be available to help communities provide safe water supplies and excreta disposal facilities in their schools. The installation, maintenance and proper use of these facilities and their relationship to health can provide a good basis for practical instruction. Likewise the distribution of UNICEF dried milk to schools offers an excellent practical starting point for nutrition education.

\* \* \*

These are but a few of the ways in which the governments, WHO and UNICEF are working together to improve the health of mothers and children in the developing countries. There can be no doubt that while much remains to be accomplished in this field, a substantial beginning has been made.

## MALARIA SYMPOSIUM IN BANGKOK

A Malaria Symposium organized by WHO was held in Bangkok on the invitation of the Government of Thailand from 13 to 20 December 1957. It was attended by anti-malaria workers from Afghanistan, Burma, Cambodia, Ceylon, India, Indonesia, Iran, Israel, Laos, Federation of Malaya, Nepal, North Borneo Territory of Papua and New Guinea, the Philippines, Sarawak, Taiwan (China), Thailand, Viet Nam, and West New Guinea. Observers were present from United States, International Co-operation Administration missions in several of these countries and territories, and from UNICEF. WHO was represented by the Chief of the Malaria Section at Headquarters, the Malaria Advisers for the South East Asia and Western Pacific Regions, and field staff from various countries in these Regions. Dr. A. Gabaldon from the Malaria Division of the Venezuelan Ministry of Health was invited by WHO to attend as a consultant.

The subjects of discussion included surveillance techniques in malaria eradication

programmes, the problem of residual foci of transmission, chemotherapy in malaria eradication, susceptibility and resistance of vector species to insecticides, spraying and the planning and inter-country co-ordination of eradication programmes. The conclusions of the Symposium on these subjects are summarized below.

### Surveillance

In its sixth report the WHO Expert Committee on Malaria defined surveillance as being mainly concerned with the search for residual or imported cases of malaria while eradication programmes are in progress or after they have been discontinued together with the measures to be taken after any such foci have been detected.<sup>1</sup> This definition was borne in mind by the participants in the Symposium during their discussions.

Surveillance can most usefully be started when transmission of malaria has been almost completely interrupted i.e. in the year following the reduction of (a) spleen rates (in children aged 2 to 9) to below 10 (b) parasite rates (in children aged 2 to 9) to below 2/ and (c) parasite rates in infants to nil

If surveillance and spraying combined result in a further decline of the spleen and parasite rates in children if infant parasite rates continue to be nil and if the surveillance data reveal a negligible incidence of autochthonous transmission of malaria spraying should be discontinued and surveillance continued for a further period of two or three years

The continuance of surveillance after the withdrawal of spraying serves three purposes (i) the prompt detection of fever cases which can then be treated before they generate secondary cases (ii) the confirmation of eradication through the intensive investigation of malaria morbidity and (iii) the detection of residual foci of infection which might necessitate further eradication measures

According to the sixth report of the WHO Expert Committee on Malaria malaria eradication "may be assumed when an adequate surveillance system has not discovered any evidence of transmission or residual endemicity despite careful search for three consecutive years in the last two of which at least no specific general measures of anopheline control have been practiced" \*

#### *Procedures*

The following surveillance procedures were recommended by the Symposium

1 "Active" search for cases involving regular visits to each house in the area of eradication

2 Passive search for cases (notification by patients medical practitioners or other agencies)

3 Treatment of detected cases The general practice is to treat all fever cases without

awaiting microscopic diagnosis with 4 aminoquinolines (chloroquine or amodiaquine) in a single dose In some countries pyrimethamine is also administered and in others 8 aminoquinolines are given in microscopically diagnosed cases (5-day treatment in *falciparum* malaria and 14-day treatment in *vivax* and *malariae* malaria)

4 Epidemiological investigation of proved malaria cases to determine if they are (a) imported (b) sporadic (relapses due to infections acquired in previous years) (c) induced (as a result of blood transfusion or other parenteral inoculation of plasmodia) (d) introduced (spread locally by imported reservoirs of infection) or (e) indigenous (spread locally by casual reservoirs of any category)

5 Adoption of measures including the resumption of spraying to deal with indigenous malaria cases discovered during the surveillance period

#### *Organisation*

It is essential for the surveillance procedures to cover the whole population of the eradication area so that all residual reservoirs of infection may be detected. When transmission is largely interrupted, infant parasite rates may be nil even in the presence of low grade autochthonous transmission and house-to-house visits are the only means of detecting positive cases and ensuring their treatment

In areas with well-developed rural health services the staff of these services may be used for surveillance but should be supplemented by staff specially trained for the purpose In general there should be one inspector to every 10 000 inhabitants in the eradication area The frequency of visits will depend on the local epidemiology of the disease

When the consolidation phase of the eradication campaign is finished—i.e. two to three years after withdrawal of spraying—surveillance may be left entirely to the regular local health staff In areas where health services are under-developed the malaria surveillance personnel may well form the nucleus of a rural health service

### *Special studies*

As surveillance is a relatively new concept and its procedures are often empirical special studies should be undertaken on the nature and pattern of surveillance procedures. The following subjects of study were suggested at the Symposium: the most feasible procedures for detecting all reservoirs of infection; the maximum period up to which parasitaemia may be allowed to continue before radical treatment is given; and how frequently visits should be made in order to ensure that reservoirs of infection are detected and treated before they can do much harm.

### *Residual foci of transmission*

The Symposium defined a focus of transmission as a circumscribed area where malaria cases occur as a result of the contact of gametocyte carriers with vector mosquitos, such circumscribed areas being a part of a considerably larger area or country in which malaria transmission has been or had been deemed to have been completely interrupted or has been unknown to occur previously.

In the later stages of an eradication programme residual foci of transmission present a serious threat to its success. There are two ways of dealing with the problem: (a) clearance of detected foci; and (b) prevention of foci.

### *Clearance of detected foci*

The first step is to apply insecticides immediately in order to stop transmission; the next is to treat infected individuals with antimalarial drugs. In one country it is the practice to trace and treat all cases as quickly as possible, repeating treatment twice at weekly intervals and once more a fortnight later. The focus is then kept under observation for a year: it is visited every month and submitted to routine spraying at intervals of three months. Amodiaquine (or chloroquine) and primaquine are used for treatment, the dosage varying with individual foci. If the focus is small treatment is given only after blood smear examinations. If brisk transmission is taking place all fever cases are treated immediately and blood smears are

taken at the same time. If the focus is primarily one of *P. falciparum* all fever cases are given five single doses of primaquine daily for three days in addition to the daily doses of amodiaquine or chloroquine. In all other cases a 14 day course of primaquine is given in addition to the amodiaquine or chloroquine.

### *Prevention of foci*

The occurrence of foci of transmission when spraying is interrupted after an adequate period of total coverage indicates the continuing presence of a certain number of gametocyte carriers in contact with vector mosquitos. Notwithstanding the practical difficulties involved an extensive attack on the parasite as well as the vector from the outset of the eradication programme is the best way of ensuring that no residual foci will occur in the later stages. For this purpose existing personnel for the treatment of cases, supervisors of spraying squads and other available field staff might be trained to administer radical cure.

### *Chemotherapy in malaria eradication*

Chemotherapy has its place in the normal course of any malaria eradication campaign but is especially useful when insecticide spraying is ineffective owing to the behaviour or reaction of the vector to the condition of the local housing or to the fact that the population is nomadic or semi nomadic and does not live in regular fixed dwellings.

Gametocytocidal drugs should be used during the concluding stages of eradication, especially in areas of refractory malaria where the application of residual insecticides has not been entirely sufficient to stop transmission.

Mass drug treatment procedures vary from country to country, the chief problem being to obtain the co-operation of the population under treatment. A point raised at the Symposium was that antimalaria personnel should observe patients as they take the drugs. In one place it was found that only about 5% of the tablets distributed were actually taken when this precaution was neglected.

The use of medicated salt is being considered by at least four countries in the South East Asia and Western Pacific Regions where the conventional means of eradication may prove inadequate owing to the migratory nature of the population and the relative inaccessibility of certain populated areas

### Insecticide susceptibility and resistance

The Symposium briefly reviewed the various types of resistance of vector species to insecticides with special reference to physiological and behavioural resistance. The possibility of combating resistance by changing the insecticide or increasing the dosage was discussed. It was noted that in Java an increase in the dose of insecticide had proved ineffective against DDT resistant *A. sundanensis* while the substitution of dieldrin for DDT had given good results. Eradication campaigns should however aim at stopping the transmission of malaria before resistance becomes a problem.

It is important to test vector species before spraying begins in order to determine their natural level of susceptibility (LC<sub>50</sub>) to the insecticide used. This will permit the measurement of changes in susceptibility during spraying.

### Spraying

The participants in the Symposium agreed that the aim of residual insecticide spraying is to achieve for a certain period complete interruption of transmission. Adequate surveillance measures will then ensure the continued absence of autochthonous transmission.

Spraying should not be confined merely to villages where spleen rates are above a certain level or to vector resting places as determined by routine entomological studies but should cover all areas exposed to the risk of malaria.

### Dosage and formulation

The choice of insecticide, the dosage and the frequency of spraying are all governed by local conditions such as the duration of transmission, the susceptibility of the vectors

the nature of the surfaces to be sprayed, local availability of materials and relative costs. The formulations used should conform to the standard specifications recommended by WHO.

### Co-operation of the public

In most countries in the South East Asia and Western Pacific Regions the attitude of the public to house-to-house spraying is at first sceptical if not resentful. A phase of enthusiastic co-operation follows perhaps because of the effect of the insecticide on ants, spiders, cockroaches, bugs and other domestic pests. Three or four years later when this effect is less marked and malaria is no longer a common ailment, apathy develops followed by active opposition to house spraying and reluctance on the part of administrators to allot further sums for the attack on malaria.

Opposition to spraying is mainly due to ignorance and the remedy is health education. The public should be told the basic facts about malaria control and kept constantly informed of the progress and results of the eradication programme. It should be made clear from the outset that the effect of the insecticide on domestic insect pests is only temporary and that the primary purpose of the spraying is to prevent the transmission of malaria.

### Planning an eradication programme

Malaria eradication is an urgent measure outside the usual routine of the national health department and although it should be considered as part of a country's general health programme its integration into the general health organization should be deferred until an adequate period of surveillance has shown that there is no danger of a recurrence of autochthonous transmission.

The technical and operational direction of an eradication programme should be in the hands of a technically competent central organization vested with adequate supervisory authority. Among the countries represented at the Symposium central anti-malaria organizations already exist in all



those with country wide programmes namely Afghanistan Burma Cambodia India Iran Israel the Philippines Taiwan (China) and Thailand

### *Legislation*

Legislation may have to be enacted to give antimalaria workers right of entry into houses for survey spraying and assessment purposes and in connexion with the compulsory notification of the disease. It may also be needed to give the national malaria service greater scope in matters of recruitment to ensure adequate financial support for the whole period of the programme and to give the director of the eradication service full control of the funds allotted to the programme

### *Preliminary surveys*

The eradication programme should be preceded by preliminary surveys or by pilot operations in limited areas. The first purpose of a preliminary survey is to delimit the malarious areas of the country as eradication rather than control is the object these should include all areas where any degree of transmission occurs. The second purpose is to establish the season or seasons of transmission the nature and distribution both topographical and seasonal of the vector or vectors and information on vector habits (e.g. resting reaction to different insecticides)

### *Attack phase*

This phase of the programme should not only be carefully planned beforehand but should be continually reassessed while it is in progress. If there is clear evidence that the transmission of malaria is being completely interrupted all is well but if interruption is not complete the reason must be found and the necessary measures taken. If epidemiolo-

gical and entomological studies could be continued side by side with the eradication measures time might be saved and difficulties averted

It is essential during the attack phase to ensure that the measures decided upon are carried out as completely and efficiently as possible and in particular that the insecticide is applied in the right dose by the right method and at the right time

### *Inter country co-ordination of programmes*

The necessity of co-ordinating all phases of malaria eradication operations in neighbouring countries was generally accepted by the participants in the Symposium. In the preparatory phase exchange of information on the results of preliminary entomological and parasitological surveys is of the utmost importance. Other information which should be exchanged in this phase includes results of delimitations of malarious and non malarious areas data about areas of difficult access (which tend to become residual foci especially when they are situated along frontiers) usual movements of nomads etc

In the phases of consolidation and maintenance information should be exchanged on such subjects as residual foci of transmission reappearance of malaria vectors thought to be eradicated etc. Measures to prevent the introduction or re introduction of malaria vectors by ship or aircraft are also indicated in these phases

The principle that malaria eradication can be obtained only by the joint and co-ordinated efforts of all governments and agencies concerned has found practical application in the South East Asia Region where an Anti malaria Co-ordination Board has been established for Burma Cambodia Laos Thailand and Viet Nam

## BAGHDAD MEETING ON MALARIA ERADICATION

For the countries of the Eastern Mediterranean Region malaria is still the greatest public health problem. Out of a total population of 190 million people 140 million live in malarious areas and only 33 million are covered by present control and eradication operations. So far four countries—Iran, Iraq, Lebanon and Syria—have adopted plans for the eradication of malaria but eradication programmes are in preparation in several other countries.

With the object of co-ordinating these programmes and providing an opportunity for the discussion of common problems a Technical Meeting on Malaria Eradication was organized by the WHO Regional Office for the Eastern Mediterranean from 7 to 12 December 1957. The meeting took place in Baghdad, Iraq, and was attended by delegates from Cyprus, Egypt, Iran, Iraq, Jordan, Lebanon, Saudi Arabia, Somalia and Syria as well as by WHO staff from several of these countries from the Regional Office and from headquarters. Observers were also present from UNICEF, UNRWA, the United States International Co-operation Administration and the Rockefeller Foundation.

The meeting heard reports on the progress that had been made in the various participating countries in implementing malaria eradication programmes. It was noted that certain administrative and financial difficulties had been encountered and to overcome these the meeting made the following recommendations:

1. Every country should set up a central malaria service responsible for planning the campaign, engaging the staff, directing and supervising the operations and co-ordinating all activities in the field of malaria throughout the country.

2. Governments should approve a special budget for malaria eradication, distinct from

funds allocated for other communicable disease control and guaranteed for a period of at least five years.

3. The Director of the Malaria Eradication Service should have control of the allocated budget and authority to take all administrative measures necessary for the implementation of the programme. It was suggested that he should be assisted in these functions by a Malaria Eradication Board.

4. The remuneration of personnel should be increased by the award of a special malaria eradication allowance and the status and tenure of employment of key personnel should be improved.

5. Personnel engaged in eradication operations should have legal right of entry into private houses.

6. Legislation should be passed to make the notification of malaria cases obligatory and to require that all cases should receive proper treatment.

7. Insecticides and antimalarial drugs should be exempt from customs duty.

It was pointed out that the success of an eradication programme in one country can be jeopardized by lack of similar measures in neighbouring countries with consequent risk of reinfection. Malaria eradication schemes should therefore be co-ordinated with adjoining countries through the WHO advisory staff or by direct contact. Bilateral agreements should be encouraged and it was suggested that countries might arrange an interchange of teams to deal with frontier areas such operations being co-ordinated through a boundary commission.

The meeting stressed the importance of proper training of personnel at all levels and discussed a number of aspects of this question.

Before a plan of operations is drawn up a thorough survey of the area must be made

those with country wide programmes namely Afghanistan Burma Cambodia India Iran Israel the Philippines Taiwan (China) and Thailand

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In the phases of consolidation and maintenance information should be exchanged on such subjects as residual foci of transmission, reappearance of malaria vectors thought to be eradicated, etc. Measures to prevent the introduction or re-introduction of malaria vectors by ship or aircraft are also indicated in these phases.

The principle that malaria eradication can be obtained only by the joint and co-ordinated efforts of all governments and agencies concerned has found practical application in the South East Asia Region where an Anti malaria Co-ordination Board has been established for Burma, Cambodia, Laos, Thailand and Viet Nam.

## TRACHOMA CONTROL IN TAIWAN

*The trachoma control programme in Taiwan (China) dates back to 1952 when the Government with assistance from WHO and UNICEF—estimated the prevalence of trachoma on the island and the best means of large scale treatment. A mass campaign was subsequently launched for the control of the disease among Taiwan schoolchildren. The article that follows gives details on the organization and development of the programme, the methods employed and plans for the future.*

### Preliminary investigation

In 1951 31% of all patients attending the ophthalmic department of the National Taiwan University Hospital at Taipei in northern Taiwan suffered from trachoma at Kaohsiung Provincial Hospital in the south of the island 80% of patients with ophthalmic troubles were affected by the disease. At that date the methods commonly used to treat trachoma in Taiwan were the expression of follicles scarification the application of copper sulfate or silver nitrate and actual cautery. Treatment with sulfonamides and antibiotics had not yet been used systematically or on a large scale.

A WHO consultant—Dr Vincent Tabone—visited Taiwan in September 1952 to examine the situation. On his recommendation and with assistance from WHO and UNICEF the Government conducted an investigation into the prevalence of trachoma among schoolchildren and their family contacts and the possibility of large scale treatment by modern methods.

The investigation was undertaken by the Taiwan Trachoma Control Centre and carried out by three teams each consisting of an ophthalmologist and a nurse. The classification of trachoma applied was that recommended in the first report of the WHO Expert Committee on Trachoma.<sup>1</sup>

Pupils in six selected schools in the Taipei area were examined. Out of a total of 7021

3281 (46.7%) had trachoma and 1955 (27.8%) had conjunctivitis (including doubtful trachoma). These cases were treated with 1/



Dr Vincent Tabone examining a Taiwan schoolboy

antibiotic (Aureomycin or Terramycin) ointment twice or four times a day the trachoma cases for two months and the conjunctivitis cases for one month. Surgical treatment was discarded except for special cases.

<sup>1</sup>Based on report by Dr Chan Yui Shu, Public Health Administrator, WHO Regional Office for the Western Pacific.

and data collected on the climate topography communications and the living conditions and way of life of the population Special malarionometric and entomological surveys are also necessary

A number of technical problems were discussed at length Resistance has already been encountered in *Anopheles stephensi* one of the important local vectors in Saudi Arabia Iraq and Iran<sup>1</sup> This resistance appears to be specific for DDT and the meeting endorsed the use of dieldrin in these areas It was recommended that regular assessments of susceptibility should be made at different times of the year before any spraying operation starts to provide a base line for the comparison of susceptibility within a particular area Such tests will also serve to determine which insecticide should be used and in what dosage

Although residual spraying with adulticides is the method of choice the use of larvicides was recommended in certain areas for example where the breeding places are widely scattered and effective adulting is rendered impossible owing to vector behaviour and unusual topographical factors This applies to the case of *A. sergenti* in Jordan

Another problem is that of sorption of

insecticides on wall surfaces Studies on the sorptive properties of mud walls in southern Iran have revealed a rapid loss of the insecticides sprayed The problem has not yet been fully studied in other areas

In many parts of the Eastern Mediterranean millions of people live a nomadic life and in the course of their wandering often cross national frontiers There is thus a potential danger that they may carry infection from one country to another The distribution of antimalarial drugs is in many cases the best means of dealing with this problem but spraying of tents should also be carried out where this is practicable In Iraq spraying of tents with DDT in kerosene has been found to remain effective for about 40 days which is considered adequate for the protection of tribes when crossing infected areas

The meeting expressed great satisfaction at the steps taken to control malaria among pilgrims at Mecca and Jeddah and welcomed the idea that similar control measures should be extended to Medina and other stations situated on the pilgrims routes There was a general wish that WHO should continue the study of the best methods of keeping aeroplanes ships and vehicles free from insects

### Hebrew translation of WHO monograph

An abridged version of the monograph *Maternal Care and Mental Health* by Dr J Bowlby (World Health Organization Monograph Series No 2) was published in Hebrew last year by the Soud Institute for Child Welfare Jerusalem This monograph was originally issued by WHO in English and French in 1951 a Spanish version was subsequently published by the Pan American Sanitary Organization It has also appeared in Danish Finnish Serbo-Croat and Swedish translations

or of tissue provided by the teacher. When all the children had been treated the tubes of ointment were collected and put away. In the higher classes the children treated one another under the supervision of a teacher. Each child received two treatments a day.



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The average amount of ointment used was two 3.5 gram tubes for each case of trachoma and one tube for each case of conjunctivitis. Additional ointment was supplied when these amounts were found to be insufficient.

Trachoma cases were re-examined after two months treatment and classified as cured, improved, unchanged or aggravated. All uncured cases continued to receive the same treatment for another month. The unchanged or aggravated cases were also given sulfonamides orally, the dosage being 40-50 mg per kg of body weight each day for 6 days. Cases showing any untoward

symptom due to medication were referred to doctors.

After a second re-examination uncured cases were treated for a further month in the same way. Care was taken not to administer sulfonamides to unchanged or aggravated cases until 10 days after the previous course had finished.

The third re-examination took place four months after the beginning of treatment. Uncured cases were then referred to the ophthalmologist at the nearest hospital for further treatment or if necessary operation.

Cases of conjunctivitis and other infectious eye diseases were treated for one month, and re-examined a month later.

### Extension of the campaign

During 1955 it was decided to extend the campaign and continue it throughout 1956. The number of schoolchildren and family contacts to be covered was increased to 2013 000 so as to include children entering school for the first time during 1955 and 1956. It was estimated that this extension would mean a further cost to the Government of more than \$500 000. An additional \$342 000 was allocated by UNICEF for antibiotic ointment and sulfonamides and for tyres and inner tubes.

At the end of June 1955 275 trachoma teams had been trained and were at work. By early 1956 448 teams (including 83 teams composed of school physicians and school nurses) were engaged in the campaign and over 30 000 schoolteachers were giving treatment and health talks.

### Assessment of progress

A WHO consultant—Professor Ida Mann—went to Taiwan in June 1956 to assess the progress made. By then all children at school had been covered by the campaign and preparations were under way for the examination and treatment of new pupils entering school the following September.

Professor Mann examined data on a sample of 1633 schoolchildren from urban, rural, salt producing and tribal (aboriginal) areas. The sample included children treated

After two months of treatment 75.1% of the conjunctivitis cases were declared cured while of the trachoma cases 42% were cured and a further 46.1% showed some improvement. There was no appreciable difference between the results for cases treated four times a day and those for cases treated twice a day. Tresomide (sulfamerazine sulfadiazine and sulfathiazole combined) was given to 141 cases which had shown no appreciable improvement after two months treatment with ointment as a result 66 of these cases were cured.

The results of the investigation were felt to justify the launching of a mass campaign.

### Plan of operations

Under an agreement between the Government, WHO and UNICEF it was decided to aim at the free examination, treatment and follow up of all pupils in Taiwan schools (a total of about 1 200 000 children) and of about 100 000 family contacts. It was hoped in this way to effect a substantial reduction in the number of cases of trachoma and conjunctivitis and in the sources of infection. The campaign was to be conducted by the Government and WHO was to provide technical advice. Equipment, supplies and transport were to be provided by UNICEF.

The estimated Government expenditure for the campaign as originally planned was approximately \$215 000. This was to cover salaries, locally available equipment and supplies, stationery, fuel and maintenance of UNICEF vehicles and storage and distribution of UNICEF supplies. UNICEF agreed to contribute vehicles (station wagons), pocket magnifying glasses, antibiotic ointment, sulfonamides and absorbent cotton to a value of \$327 000.

### Staff

The Taiwan Provincial Health Commissioner was entrusted with the administration of the campaign. A Trachoma Control Committee including representatives of the Department of Education and of the College

of Medicine of the National Taiwan University was appointed to advise on the conduct of the operations. The Director of the Taiwan Trachoma Control Centre was put in charge of the day to day administration of the campaign and the collection and analysis of records.

In preparation for the campaign the Trachoma Control Centre held 3 day refresher courses for ophthalmologists from 12 provincial hospitals. These ophthalmologists in turn undertook the training, guidance and supervision of trachoma teams and special treatment of serious cases referred to them by the teams.

A trachoma team consisting of one doctor and one nurse was recruited from each of the 365 health stations in Taiwan. Following training at one of 12 provincial centres each team conducted the campaign in the area served by its health station. Team responsibilities included health education, the instruction of school directors and teachers in treatment methods and in the maintenance of records, the examination of school children and the prescription of appropriate treatment, supervision of the treatment given by teachers, the carrying out of urine tests for children receiving sulfonamides. In some schools these tasks were performed by the regular school physicians.

### Examination and treatment

The campaign started in September 1954. During the first month trachoma teams which had completed their training worked half a day for five days a week, aiming at an average of between 150 and 200 examinations each per half day.

The treatment of infected children started immediately after examination. The children in the lower classes of each school being treated by their teachers. At the appointed time the children who were to be treated washed their hands and were given individual tubes of antibiotic ointment. Each child in turn went up to the teacher who took the ointment and applied it under the lower lids of the child's eyes. The child then spread the ointment with two small squares of cotton

## AÉDES AEGYPTI ERADICATION IN THE UNITED STATES

For some time after the Second World War very little attention was paid by the United States health authorities to *Aedes aegypti* the mosquito vector of yellow fever. Although this mosquito is present in some regions no epidemic of yellow fever has been noted in the United States since 1905 when the disease broke out in New Orleans. The last isolated case was notified in 1924 at Houston Texas.

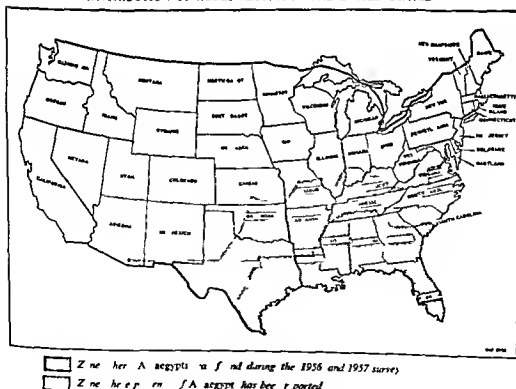
Recently however there has been a renewal of interest in this insect. The wave

of jungle yellow fever which in 1948 began in the west of Panama (an area where yellow fever had been unknown for 43 years) has now reached the southern frontier of Mexico. While it is true that this form of yellow fever primarily affects monkeys—being transmitted by forest mosquitoes of the genus *Haemagogus*—unvaccinated humans who go into the forest can become infected. Some anxiety was also caused by a case of urban yellow fever notified in 1954 in Trinidad<sup>1</sup> and probably due to the bite of *A. aegypti*.

Based on an article by O. R. H. yes, & M. E. Tinker in *Bol. Off. Sanit. Panamer.* 1958 45 2...

See CH on Wild Ills Orig 1956, 10 39

### DISTRIBUTION OF AÉDES AEGYPTI IN THE UNITED STATES





for trachoma at the beginning of the campaign (September-December 1954) and children treated on entering school for the first time a year later. The results of treatment were as follows:

*Percentage of active cases*

	<i>First group</i>		<i>Second group</i>	
	<i>Sept 1954</i>	<i>Jan 1956</i>	<i>Sept 1955</i>	<i>Jan 1956</i>
Urban areas	76.9	10.4	62.2	15.1
Rural areas	58.9	14.2	38.4	8.6
Salt producing areas	66.6	27.7	69.0	32.6
Tribal areas	85.4	34.9	80.8	28.2

The disease was relatively mild in city children, moderately severe in rural children and severe in children from salt producing and tribal areas.

The WHO consultant made a number of recommendations for the future conduct of the campaign as a result of which certain changes were introduced. First of all it was decided to re-examine trachoma cases 6 months and 12 months after treatment in order to gain a clearer idea of the long term results. Likewise it was decided not to undertake a second course of treatment for at least six months—or preferably a year—after the initial treatment. To deal with relapses and to ensure that no child left school with active trachoma, all children would be re-examined at the beginning of their final school term and if necessary given another course of treatment. As trachoma is rarely contracted after the age of 12, this seemed to be a good way of ensuring that its prevalence among the rising generation would be reduced to a minimum.

The WHO consultant considered that it might be more economical to use antibiotics in oil instead of ointment for treatment. Trials on separate groups of 5000 children each were therefore started to assess the relative merits and costs of treatment by antibiotic ointment and by antibiotics (Achromycin and Aureomycin) in oil. A 6-week course of initial treatment was also tried out. In areas where the trachoma infection rate among schoolchildren was more than 50% the mass treatment of family contacts was started.

Professor Mann also recommended the mass treatment of the whole population in the tribal areas where insanitary conditions prevailed and the disease was particularly widespread and severe. It was decided to try out courses of treatment with sulfanilamides in those areas.

### Position at end of 1957

In late 1957 Dr Vincent Tabone again visited Taiwan on behalf of WHO this time to review the progress of the campaign and to evaluate the results of the trial treatments introduced the previous year. He considered that there was little to choose between ointment and oily drops as means of administering antibiotics and favoured the continuation of the 2-month course of initial treatment. He noted that there were fewer trachoma cases than in previous years among new school entrants in the areas where the mass treatment of family contacts had been carried out.

As a result of these and other findings by Dr Tabone it was decided to continue the examination and treatment of schoolchildren along the lines originally adopted but with re-examinations 12 months after initial treatment. Re-examinations of children about to leave school are also being continued. The mass treatment of family contacts is to continue in as many places as possible and the staff of the Trachoma Control Centre is being strengthened. Trial treatments of pre-school children with antibiotic ointment have been started as a preliminary to their mass treatment. A special short course of treatment has been instituted for aborigines living in tribal areas where each patient will receive sulfa tablets for two weeks, the total daily dose being 50 mg per kg of body weight. It is estimated that 140 000 aborigines will be treated in this way.

In the opinion of Dr Tabone it should be possible to withdraw international assistance from the programme before the end of 1962 by which time the mass treatment of aborigines and of 1½ million pre-school children should be successfully completed.

# Reports of Expert Groups

## MENTAL HEALTH AND ATOMIC ENERGY

WHO has recently published the findings of an international group of experts convened to study the mental health aspects of the peaceful uses of atomic energy.<sup>1</sup> The participants who were representative of several different disciplines—psychiatry, atomic and radiation medicine, public health, social anthropology, and scientific journalism—examined reports from all over the world concerning the emotional impact of atomic energy development as reflected in everyday life, public statements, newspaper comment, letters to atomic health, political and religious bodies as well as the results of clinical inquiries.

In the minds of people everywhere, atomic energy remains a threatening and mysterious force interpreted very often in magical rather than rational terms and fraught with irrational hopes and fears. Confronted by the tremendous scientific and technical achievement of atomic science—the intellectual or vocational prerogative of the few—the great mass of people according to the Study Group is in an analogous position to that of the young child first experiencing the world. Some understanding of this phenomenon can be obtained from a study of the ancient primeval attitudes belonging to the "childhood of mankind."

Man's anxiety about his own search for knowledge and his power is reflected almost universally in myth and legend. For example, Prometheus, a steal-giver, the prerogative of the gods, not only came to understand this prerogative but also operated it for the use of men and for this act of presumption was terribly punished. Pandora wantonly unleashed forces she could not control because she once again

tampered with the prerogative of the gods, but since her action was accidental and innocent, mankind was left with hope. However, when Faust evoked the Devil in order to assume the powers of God, there was nothing accidental about his action and he was in consequence doomed to devastating punishment. The association of knowledge with evil and punishment exists nowhere more explicitly than in the story of the Garden of Eden, but it is found also in many other places, as for instance in an ancient Egyptian saying: "When man learns what moves the stars, the Sphinx will laugh and life will be destroyed."

There can be no doubt about the universality of this feeling of man's punishment for presumption, and it finds an arresting parallel in that universal experience of all mankind—that of being a child.

From the point of view of development, being a child means being helpless and dependent upon powers that seem capable of bestowing almost infinite benefits or of inflicting ultimate punishment. Children who defy parental authority can relapse into primitive forms of thought and feeling—and such a reaction is characteristic of much of the psychological attitude towards nuclear energy.

### Brain damage from radiation

The Study Group examined the question of the pathogenic effects of radiation on brain function. Data are scanty and the need to develop an international exchange of information on research findings is becoming increasingly apparent. An indisputable fact which has emerged is that nervous tissue, although one of the most resistant of all tissues, can be severely damaged by doses of radiation below the lethal limit. Experimental work on animal embryos and young animals moreover has confirmed the radiosensitiveness of nervous tissue during the

<sup>1</sup>WHO Study Group on the Mental Health Aspects of the Peaceful Uses of Atomic Energy (1955) *Report of the Study Group*, No. 1571, 53 pages. Price 1/6 \$0.60. Sw fr. 2. Also published in French and Spanish.

The United States health authorities are less concerned about the northward spread of jungle yellow fever than about the introduction of the virus by human beings, animals or mosquitos—a particular danger in these days of rapid communications. Once in the country the virus would find a permanent host in *A. aegypti* which abounds in certain regions; this would renew the danger of transmission of urban yellow fever.

Even before the wave of jungle yellow fever in the Americas began to spread towards the north, the Pan American Sanitary Organization had recommended the eradication of *A. aegypti* as a means of preventing large-scale epidemics. Some countries in the Region have conducted campaigns against this mosquito in recent years and have succeeded in eradicating it from their territories.<sup>2</sup> The United States, however, has not yet undertaken a nation-wide eradication programme, though a few partial surveys have been made since the war. The authorities are now contemplating a campaign on a national level.

The first steps would have to include the delimitation of the zones inhabited by *A. aegypti* and an evaluation of the density of the mosquito populations. Of the surveys

already made, the most important were one in 1956 covering 25 communities and another in 1957 covering 8 communities. The map on page 377 gives some idea of the results. The dark shading shows the zone where *A. aegypti* is frequently found. Its boundary line passes through Charleston, Columbia (S.C.), Augusta, Atlanta (Ga.), Nashville, Memphis (Tenn.), Monroe (La.), Dallas (Tex.) and Nuevo Laredo (Tamaulipas, Mexico). The mosquito is also found in the zone indicated by lighter shading, though less frequently, because the environment is not favourable.

The partial surveys of 1952 showed some contraction of the *A. aegypti* zones, and this tendency is confirmed by the records for 1956 and 1957. This gradual decline may be due in part to the widespread use of insecticides, particularly in agriculture, to improved living conditions and to the health education of the public who are now aware of the danger inherent in potential mosquito breeding places.

It should, however, be borne in mind that despite this apparent improvement in the situation, *A. aegypti* is still present in all the southern states and is multiplying in some areas. If it is to be eradicated, the campaign will be a large and costly undertaking, since it will have to cover an area of some 300 000 square miles.

and eventually people their children and their children's children

In this discussion of unhealthy emotional responses the Group drew attention to a somewhat surprising discovery—namely that fantasies about nuclear energy unlike those connected with other expressions of mechanical power such as electricity radio and radar were absent from the delusional systems of psychotic and psychoneurotic patients. The Group felt that this finding was worthy of further investigation

#### Interaction between scientists authorities and the general public

Surrounded by confusion and fears the general public is apt to have little confidence in pronouncements either scientific or governmental. On the one hand the people are confronted with apparent contradictions stemming from the widespread publicizing of disavowal among scientists not only with regard to nuclear energy matters but also in connexion with such questions as poliomyelitis vaccine and the carcinogenic effects of tobacco. As the Study Group states

Scientists do not make the task easier when they vacillate between statements limited to their scientific competence and statements which have the mantle of science but which are actually expressions of value and even of policy decision.

A general tendency to question the veracity of political dicta on the other hand is perhaps partly due to the public's wariness of propaganda after the experience of two world wars.

The relations of scientists and politicians also generate anxiety because of the uncertainty as to who wields the power and how.

In one sense the political leader has power over the scientist but in another he is dependent on the scientist and hence on his power. The advent of nuclear power has taken the ultimate strength out of the hands of the services under political control and placed it in the hands of the scientist. The scientist is civilian and not in the direct service of the State and in his role of scientist owes his first allegiance to scientific truth. No social institutions have been developed to hold him individually in thrall to the

civilian power as a scientist he has had no special training in discipline and obedience. It is not unnatural, therefore that political leaders develop into hostility to the scientists and so promulgate unrealistic decisions in attempts to control the scientific situation in the teeth of the scientists.

The report points out that few if any political leaders have had the scientific training to enable them to see the ultimate implication of scientific work. The effect is general bewilderment and a suspicion "that the political leader instead of being the master of the situation is in fact caught between the scientists and the next election."

#### The press

Since the public learns about atomic developments mainly from the press the role of the journalist appears to be extremely important. The Study Group was impressed by the general standard of integrity with which journalists handled atomic energy news but regretted a widespread tendency to present this news under scare headlines which left an enduring impression even if the substance of the story was sober and at times reassuring. The tacit newspaper principle is that "bad news is good news" and this has profound implications for mental health and morale.

Annexed to the Study Group's report is an analysis of press comment on atomic energy. The sample surveyed consisted of 504 press cuttings from 31 countries and the files of three British daily papers as well as those of a weekly magazine and a monthly digest published in the USA.

#### Mental health tasks

The WHO experts felt that the complexity of underlying emotions in the changing environment brought about by the advent of the atomic age needed to be recognized more widely among leaders of thought and action. The first task, they said seemed to be the establishment of what might be termed a culture of change in which change and reorientation could take place without upheaval. The chief effort would have to be directed towards children. Their upbringing

developmental period for doses as low as 100 200 roentgens have been shown to cause serious malformations of the brain. The adult brain however appears to be exceptionally resistant to radiation. The Study Group concludes that with the low dosages of radiation to be encountered in the peaceful uses of atomic energy the organic brain effects so far observed are of minor or no importance.

### The socio-economic impact of atomic energy

The Study Group then examined the stresses which the advent of atomic energy will introduce into societies. In advanced countries a second industrial revolution might interfere with whatever social equilibrium and stability have been achieved—often at great cost—particularly if the effects of atomic energy development are added to those of other technological innovations which have already accelerated the pace of change. Says the report: "Societies have a certain threshold of tolerance for rate of change which if exceeded leads in some measure to social disorganization. And although the evidence is incomplete it does seem that the greater the degree of disorganization in the social and cultural environment the greater will be the prevalence of psychiatric disorder."

Still deeper concern is expressed about the effect upon the so called under developed areas where the advent of atomic energy in so far as it accelerates the process of industrialization can add to present social problems. Yet other dangers exist.

Where exaggerated hopes have been aroused there may be disappointment and disillusionment when nuclear installations do not prove feasible or do not at once produce a miracle in the form of a higher standard of living. The repercussions from eventual disappointment may then be severe and take the form of hostility against those populations which draw major benefits from atomic energy.

The WHO experts consider that much will depend on the attention given to human factors in planning and in development.

### Irrational fears and irrational hopes

The emotional response provoked by the advent of atomic energy while bearing some similarity to the reaction produced by other forms of technical change is often pathological partly because of the circumstances in which atomic power has been introduced (the first atomic bomb explosions) and partly because of the very nature of this power. The Study Group agreed that this perhaps constituted the most important mental health aspect of the present situation.

"Evidence of emotional reactions to atomic matters is found in everyday conversation. Atom bomb tests are frequently blamed for disagreeable weather or for the failure of the harvest. Fears of the fall-out of the inadequate disposal of atomic waste of the pollution of water and milk supplies, fears of sterility or of harmful genetic effects are direct expressions of anxiety. These fears conflict with many official announcements put out about risks and safety measures."

In this context the experts discussed the notion of "free floating anxiety" and the various ways in which the individual deals with such anxiety being unable to tolerate it in his consciousness. The mechanism of displacement for example is defined as the transference of anxiety to some object other than the true one—an object which may have anxiety raising qualities in its own right or may on the other hand be quite inappropriate. Rationalization is a special form of displacement. In such a process apparently reasonable causes are evinced in explanation of irrational feelings. Finally there is the mechanism of overcompensation—a metaphorical whistling to keep up courage.

The anxiety producing qualities of atomic energy are ascribable to the peculiar nature of radiations—unseen unheard untasted unsmelt unfelt uncontrollable (as far as the individual is concerned) and emanating from an almost infinitely small source. Of all the fears associated with atomic energy perhaps one of the deepest and most subtle is that of the setting up of a biological chain reaction that fall out or atomic waste will contaminate water soil fish plants animals.

M Dorothy Beck PASB consultant in medical bacteriology J Antonio Munoz nutritionist attached to the Guatemala Public Health Department and at present WHO consultant in Basutoland and Nevin S Scrimshaw Director of INCAP with the collaboration of INCAP the Nutrition Section of the Guatemala Public Health Department and the Bacteriological Section of the State Public Health Department Berkeley Calif USA.

### Biological control of insect vectors of disease

The development of resistance to insecticides among insect vectors of disease has led to a search for other methods of control. Although biological control by parasites has proved inadequate under normal conditions, agricultural research workers have found that it can be completely effective in isolated situations.

A WHO sponsored experiment in the biological control of the mosquito *Aedes polynesiensis*—a vector of filariasis—is at present being carried out in the Tokelau Islands in the South Pacific. In an attempt to control or eliminate this mosquito the fungal parasite *Coelomomyces stegomyiae* has been introduced on Nukunono Atoll. A second atoll, Atafu, is receiving insecticidal treatment while a third, Fakaofo, is being left untreated for purposes of comparison.

The WHO team undertaking the experiment was transported to the Tokelau Islands as part of a New Zealand Government mission sent there for work in connexion with the International Geophysical Year. The Organization is deeply indebted to the New Zealand Government for its co-operation in this respect since without it the experiment might have been too costly to contemplate. The leader of the team is Dr Marshall Laird from the Institute of Parasitology McGill University Canada who is a well known authority on biological control and has spent many years studying insect parasites and predators in the Pacific islands. Dr D H Colless of the Department of Parasitology University of Malaya Singapore prepared the infected larvae and dried cultures used in the experiment.

### Water pollution in Europe

In January of this year a group of environmental sanitation experts convened by the United Nations Economic Commission for Europe (ECE) met in Geneva to discuss problems of water pollution in Europe. The participants in the meeting included Mr N de Baenst (Belgium), Mr O Jaag (Switzerland), Mr Y Lebedev (USSR) and Mr W Madera (Czechoslovakia). Dr A Key, Senior Sanitary Officer, Ministry of Housing and Local Government, London, England, attended as WHO consultant. Officials of ECE, WHO, the Food and Agriculture Organization of the United Nations (FAO) and the World Meteorological Organization (WMO) were also present.

The report of this group was discussed by ECE at its session in Geneva in April. It proposes two definitions of water pollution, both of which take the impairment of the downstream uses of water as the most satisfactory basis for the measurement of pollution—a concept which is now almost universally accepted. The report also discusses the conflict of legitimate interests involved in the control of water pollution. In thickly populated and industrialized areas the only solution to the problem seems to be the organization of river pollution control bodies, each of which should deal with an entire river basin, regardless of administrative and even political boundaries.

The question of water pollution in Europe was also considered by the sixth European seminar for sanitary engineers which was held in Nice from 17 to 25 September under the joint auspices of the WHO Regional Office for Europe and the Government of France. The aim of these seminars is to enable sanitary engineers, public health administrators and others concerned with environmental sanitation in Europe to discuss common problems and to exchange scientific and technical information.

The principal topics considered by the

must enable them to bear with insecurity and to face reality it must be free from anxiety and hate producing in individuals self reliance and a sense of responsibility towards others. And those who held responsible positions in public life—doctors teachers the clergy the authorities—must be educated in mental health requirements.

As regards local action the Group discussed a draft plan for the education of the community in matters pertaining to atomic energy. In essence the idea is to form small teams each consisting of—for example—a psychiatrist a psychologist a sociologist and a journalist. These teams would study local conditions and contribute to the planning of new atomic enterprises and to the acceptance of such schemes by the populations concerned.

The Study Group also made a number of specific suggestions concerning research and the work to be done in connexion with mental health and the siting of atomic installations the production of atomic power and the medical use of radiations.

In conclusion the Group stated that its findings were in no way alarming although concrete enough to warrant the attention of those in authority. The Group hoped that such persons would be prepared to accept its conclusion that the behavioural sciences could make a valuable contribution to the task of adapting mankind to the advent of atomic power making the process as painless and harmless as possible and allowing man to reap a rich harvest from the seed his inventive genius has sown.

## Notes and News

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### Diarrhoeal disease in Guatemala

Investigations into the prevalence of diarrhoeal disease are at present being carried out in Latin America by research workers attached to WHO or to bodies closely connected with the Organization such as the Pan American Sanitary Bureau (PASB) which acts as the WHO Regional Office for the Americas and the Institution of Nutrition of Central America and Panama (INCAP) which is administratively dependent on PASB and subsidized by PASB and WHO.

In nearly all the countries of Latin America diarrhoeal disease in infants and children is a serious health problem.<sup>1</sup> Surveys were recently made in twelve localities in Guatemala—which has the highest mortality rate from this cause in Central America—to determine the prevalence of *Salmonella* and *Shigella* in children in the 0-10 years age group without reference to the presence or absence of actual diarrhoeal disease.

Between October 1955 and March 1956 2342 cultures prepared from rectal swabs were examined. Micro organisms of the *Salmonella* genus were observed much less frequently than those of *Shigella* the percentages being 0.55 and 7.5 respectively. Data on environment were obtained by direct observation and by the study of local statistics. The information was classified taking the following factors into account: sanitary facilities supplies of potable water disposal of waste waters ethnological characteristics altitude. In all cases where sanitary facilities were lacking or inadequate and the level of personal hygiene was consequently poor the prevalence rate was very high indeed. The rate for the indigenous children included in the survey was the highest of all.

The high prevalence rates for *Shigella* were similar to rates recorded some time ago in selected areas of the United States where *Shigella* infection was the chief cause of diarrhoeal disease mortality.

The Guatemala survey was directed by

<sup>1</sup> See Ch. 6. *Wld Hlth O r* 1953, 12, 193.

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seminar were (1) the pollution of coastal waters by domestic and industrial wastes (ground water and surface water pollution had been discussed at the two preceding seminars) (2) the collection treatment and utilization of solid wastes and (3) the treatment and utilization in agriculture of liquid and solid wastes from rural and urban communities. The seminar also heard a progress report on the control and prevention of water pollution by radio active wastes.

The following countries were represented: Austria, Belgium, Czechoslovakia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, USSR, and Yugoslavia.

#### Environmental sanitation in the South Pacific

A WHO seminar on environmental sanitation was held at Port Moresby, Papua, from 5 to 23 May 1958, with the co-operation of the Government of the Territory of Papua and New Guinea. It was attended by 25 participants and observers representing 15 countries and territories in the southern part of the Western Pacific Region. A WHO consultant, Professor Earnest Boyce of the University of Michigan, visited a number of these countries and territories beforehand to help with preparations for the seminar.

Four main topics were discussed: (i) the adaptation of environmental sanitation programmes to existing cultural patterns; (ii) health education and legislation in connexion with environmental sanitation; (iii) the responsibilities and duties of public health personnel engaged in environmental sanitation programmes; (iv) the training of environmental sanitation staff for work in the South Pacific islands.

The Port Moresby seminar was the third of a series of zonal seminars on environmental sanitation held by the WHO Regional Office for the Western Pacific. The first two covering different groups of countries were held in Taipei, Taiwan (China) in 1956 and in Singapore in 1957. They dealt respectively with the collection, disposal and utiliza-

tion of organic wastes and with rural water supplies.

#### Waterworks training course

Eighteen waterworks officials from 12 territories in the Caribbean area attended a refresher course held in Port of Spain, Trinidad, from 14 April to 3 May by the Pan American Sanitary Bureau (WHO Regional Office for the Americas) in co-operation with the Government of Trinidad and Tobago. The course was intended specifically for government officers in charge of domestic water supplies in the British territories in the Caribbean.

Two short term consultants, Professor Edward W. Moore of Harvard University and Professor George T. Bryant of Johns Hopkins University, were provided by PASB/WHO to prepare and present the lectures given at the course. These covered all the important phases of the collection, treatment and purification and distribution of water for domestic use.

#### The effect of radiation on human heredity

The WHO Expert Committee on Radiation met in Geneva from 28 July to 2 August to consider suitable methods for use in genetic research among populations living in areas where the natural radiation from sand rocks or building material is higher than normal. The chief question discussed was the nature of the statistical data obtainable from such areas which would be likely to throw most light on the effect of radiation on human heredity. The Committee's sources included the preliminary findings of WHO consultants who had already visited an area of high natural radiation in the South of India.

The members of the Committee were Professor J. A. Böök (Sweden), Dr J. C. Bugher (USA), Professor L. Cavalli Sforza (Italy), Professor A. Franceschetti, Vice Chairman (Switzerland), Dr A. R. Gopal Ayengar (India), Professor J. V. Neel, Chairman (USA), Dr W. J. Schull, Rapporteur (USA), and Dr A. C. Stevenson

(United Kingdom) Professor V R Khanolkar (India) and Dr D Klein (Switzerland) acted as consultants for the meeting. The Secretary was Dr I S Eve (WHO).

### Respiratory virus diseases

The meeting of the WHO Expert Committee on Respiratory Virus Diseases held in Stockholm during August gave specialists from a number of countries an opportunity to pool experience gained during the 1957 influenza pandemic. The intensive studies undertaken in many parts of the world during this pandemic—together with the work of the WHO Influenza Centres over the past ten years—have produced a mass of new knowledge on the natural patterns of epidemic and pandemic influenza. The Committee reviewed current methods of treatment in the light of this knowledge and considered the results of the special study undertaken by WHO during the recent pandemic to find out whether animals play a part in the epidemiology of influenza. The latter subject was also discussed at a meeting between the Committee and the Joint WHO FAO Expert Committee on Zoonoses.

As well as discussing influenza the Committee reviewed new knowledge of other respiratory virus diseases including the heterogeneous group of infections known as the common cold.

The following experts took part in the meeting: Dr C H Andrewes (United Kingdom), Dr F M Davenport (USA), Dr H Fukumi (Japan), Dr M R Hilleman (USA), Dr I G K Menon (India), Professor J Mulder (Netherlands), Professor C H Stuart Harris (United Kingdom), Dr V Svedmyr (Sweden), Professor V M Zhdanov (USSR). Dr A. Payne (WHO) acted as Secretary to the Committee.

### Expert Committee on Malaria

The WHO Expert Committee on Malaria met in Lisbon from 15 to 23 September. Since the appearance of the Committee's

sixth report<sup>1</sup>—the first comprehensive publication on the subject of malaria eradication—a number of new problems have arisen in this field.

Among the subjects discussed by the Committee were criteria for determining when the transmission of malaria has been interrupted, epidemiological surveillance, the use of drugs in the various phases of an eradication programme, health education and public relations in connexion with malaria eradication programmes.

In addition the Committee reviewed a number of less general problems such as suitable eradication techniques for areas of low endemicity, the protection of people living in fixed or mobile temporary dwellings, the possibility of organizing malaria eradication within the framework of the general public health administration, problems arising in the use of insecticides such as sorption. The situation as regards the resistance of anopheline vectors to insecticides was also discussed.

The members of the Committee were Professor M Ciucu (Romania), Dr A Ejercito (Philippines), Dr S Farman Farnasian (Iran), Dr A Gabaldon (Venezuela), Professor G Giglioli (United Kingdom), Professor G Macdonald (United Kingdom), Dr O Mastbaum (Swaziland), Dr B A. Rao (India) and Dr R A Roque (Portugal). Dr G R Coatney (USA) and Dr P F Russell (USA) acted as advisers to the Committee. Dr E B Weeks (WHO) was Secretary.

### Biological standardization

The WHO Expert Committee on Biological Standardization met in Geneva in September to review work in progress on various substances for which international standard had been proposed. The Committee also considered the text of the recommended requirements for poliomyelitis vaccine, yellow fever vaccine and cholera vaccine and of the general requirements for manufacturing and control laboratories as formulated by the

seminar were (1) the pollution of coastal waters by domestic and industrial wastes (ground water and surface water pollution had been discussed at the two preceding seminars) (2) the collection treatment and utilization of solid wastes and (3) the treatment and utilization in agriculture of liquid and solid wastes from rural and urban communities. The seminar also heard a progress report on the control and prevention of water pollution by radio active wastes.

The following countries were represented: Austria, Belgium, Czechoslovakia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, USSR, and Yugoslavia.

### Environmental sanitation in the South Pacific

A WHO seminar on environmental sanitation was held at Port Moresby, Papua, from 5 to 23 May 1958, with the co-operation of the Government of the Territory of Papua and New Guinea. It was attended by 25 participants and observers representing 15 countries and territories in the southern part of the Western Pacific Region. A WHO consultant, Professor Earnest Boyce of the University of Michigan, visited a number of these countries and territories beforehand to help with preparations for the seminar.

Four main topics were discussed: (i) the adaptation of environmental sanitation programmes to existing cultural patterns; (ii) health education and legislation in connexion with environmental sanitation; (iii) the responsibilities and duties of public health personnel engaged in environmental sanitation programmes; (iv) the training of environmental sanitation staff for work in the South Pacific islands.

The Port Moresby seminar was the third of a series of zonal seminars on environmental sanitation held by the WHO Regional Office for the Western Pacific. The first two covering different groups of countries were held in Taipei, Taiwan (China) in 1956 and in Singapore in 1957. They dealt respectively with the collection, disposal and utiliza-

tion of organic wastes and with rural water supplies.

### Waterworks training course

Eighteen waterworks officials from 12 territories in the Caribbean area attended a refresher course held in Port of Spain, Trinidad, from 14 April to 3 May by the Pan American Sanitary Bureau (WHO Regional Office for the Americas) in co-operation with the Government of Trinidad and Tobago. The course was intended specifically for government officers in charge of domestic water supplies in the British territories in the Caribbean.

Two short term consultants, Professor Edward W. Moore of Harvard University and Professor George T. Bryant of Johns Hopkins University, were provided by PASB/WHO to prepare and present the lectures given at the course. These covered all the important phases of the collection, treatment and purification and distribution of water for domestic use.

### The effect of radiation on human heredity

The WHO Expert Committee on Radiation met in Geneva from 28 July to 2 August to consider suitable methods for use in genetic research among populations living in areas where the natural radiation from sand rocks or building material is higher than normal. The chief question discussed was the nature of the statistical data obtainable from such areas which would be likely to throw most light on the effect of radiation on human heredity. The Committee's sources included the preliminary findings of WHO consultants who had already visited an area of high natural radiation in the South of India.

The members of the Committee were Professor J. A. Böök (Sweden), Dr J. C. Bugher (USA), Professor L. Cavalli Sforza (Italy), Professor A. Franceschetti, Vice Chairman (Switzerland), Dr A. R. Gopal Ayengar (India), Professor J. V. Neel, Chairman (USA), Dr W. J. Schull, Rapporteur (USA), and Dr A. C. Stevenson

tion of air water and agricultural products increases. Such contamination can be caused by uranium and thorium processing plants, atomic power stations, reactor installations and nuclear experiments, as well as by the use of radioisotopes in medicine research and industry.

A Joint WHO/FAO Expert Committee on Radiochemical Methods of analysis met in September in Geneva to consider methods which might be recommended for the determination of radio active elements in the components of man's environment and in body fluids. The members of the Committee included Dr Lyle T. Alexander (USA), Dr C. L. Comar (USA), Dr J. H. Harley, Rapporteur (USA), Professor Yoshio Hiyama, Vice Chairman (Japan), Dr H. Jammet (France), Dr Lidia A. Katchur (USSR), Mr Lars Lund (Norway), Dr A. S. McLean (United Kingdom), Dr C. Gordon Stewart, Chairman (Canada), Dr Conrad P. Straub (USA), Dr F. J. Woodman (United Kingdom), Mr L. Jeanmaire (France) and Dr M. F. Mili an (USA) acted as consultants. Dr L. Dobson (WHO) and Dr R. A. Silow (FAO) were Joint Secretaries.

### Iron deficiency anaemia

Iron deficiency anaemia is probably the most common deficiency disease in the world at the present time, affecting especially growing children and women in the reproductive period of life. In tropical and under developed countries, chronic blood loss and a poor diet combine to make the disease particularly prevalent among populations suffering from endemic intestinal parasitism.

The WHO Study Group on Iron Deficiency Anaemia met in Geneva at the end of September to discuss the etiology, detection and evaluation of the disease as an initial step in developing programmes for its prevention and treatment.

The members of the Study Group were Dr H. Foy (Kenya), Dr M. Layrisse (Venezuela), Dr M. Mofidi (Iran), Professor V. Ramalingaswami (India), Professor Richard V. Vilter, Chairman (USA), Professor A. W. Woodruff (United Kingdom). The Nutrition

Division of FAO was represented by Dr Ronchi Proja. Dr Ruth C. Steinkamp, Instructor in Medicine, Washington University, St. Louis, Mo., USA, acted as WHO consultant for the meeting, and the Secretary was Dr R. C. Burgess (WHO).

### Expert Committee on Addiction-Producing Drugs

The addiction liability of a number of new analgesic drugs from different groups of substances with morphine like effect was considered by the WHO Expert Committee on Addiction Producing Drugs at its meeting in Geneva in October. On the basis of its recommendations, the Director General of WHO will decide on the status of international control which should be applied to these drugs. His decisions will in turn be passed on to the Secretary General of the United Nations for communication to the States parties to the various international conventions on the control of narcotic drugs. The Committee also dealt with requests from several governments for the exemption from international control of certain preparations containing among other substances, some of a narcotic character at present under control.

Other questions considered by the Committee were: the inclusion of narcotic drugs in aircraft first aid kits; the use of international non proprietary names for drugs under international narcotics control; the new draft of a "Single Convention on Narcotic Drugs" and the possibility of assessing, by clinical methods, the development of tolerance to and physical dependence upon narcotic drugs. Finally the Committee once more discussed the group of habit forming (as distinct from addiction producing) drugs which are known as "tranquillizing" agents. The use of these drugs is still on the increase and has given rise to concern in many countries.

The members of the Expert Committee were Dr N. B. Eddy, Chairman (USA), Professor L. Goldberg (Sweden), Professor G. Joachimoglu, Chairman (Greece), Professor J. La Barre (Belgium), Professor

## WHO Study Group on Recommended Requirements for Biological Substances

The following experts were invited to serve on the Committee Dr M L Ahuja (India) Dr D G Evans (United Kingdom) Dr P Krag (Denmark) Dr R Prigge (Germany) Dr J Tomesik (Switzerland) Dr G V Vygodchikov (USSR) and Dr H Welch (USA) Dr D R Bangham (United Kingdom) and Dr O Maaloe (Denmark) were WHO consultants for the meeting and Dr E C Hulse represented FAO Dr N K Jerne (WHO) was Secretary of the Expert Committee

## Health statistics

Thanks in part to the work of WHO in connexion with the classification of causes of death it is now possible to establish internationally comparable mortality statistics. The terms and rates used in morbidity statistics however still vary greatly from country to country.

The WHO Expert Committee on Health Statistics therefore met in Geneva from 29 September to 4 October to review the various definitions of morbidity terms and rates at present in use and to select those which could be recommended for general application. The Committee also discussed future tasks in the field of vital and health statistics including the preparatory work in connexion with the next revision of the International Classification of Diseases. Injuries and Causes of Death. Plans for regional seminars and meetings with the aim of *improving health statistics were considered*.

The members of the Expert Committee were Mr F F Harris (Canada) Dr Gertrude Kallner (Israel) Dr Forrest E Linder (USA) Dr W P D Logan (United Kingdom) Dr B Mikat (Germany) Dr B Skrinjar (Yugoslavia) and Dr M J Aubenque (France). Dr B Pirc (WHO) acted as Secretary of the Committee.

## Expert Committee on Plague

Although the world wide incidence of plague has been substantially reduced in recent years the public health authorities

in many countries are still greatly concerned with the prevention and control of this disease.

Recent epidemiological studies in various parts of the world have indicated that wild rodent plague exists in several areas where it has not been detected previously and where it has probably remained unnoticed for a number of years. Several species of wild rodent often showing considerable resistance to the effects of *Pasteurella pestis* infection may form a local reservoir from which given favourable epidemiological conditions the disease may spread to more susceptible species of wild rodent to domestic rats and to the human population. While modern therapy and plague control techniques make it possible to save the lives of the majority of plague cases and to control outbreaks promptly and effectively the risk of an epidemic is greatest precisely in those areas where serious damage may occur before medical aid and control can be organized on the spot.

The WHO Expert Committee on Plague met in Geneva from 15 to 20 September to review recent epidemiological findings in connexion with plague and advances in knowledge and experience of the therapy and control of the disease. The possibility of profiting from the present low incidence of plague to initiate programmes of eradication was discussed as well as the measures which should be taken in countries where human plague no longer seems to represent a serious public health problem but where the risk of epidemics in rural areas requires vigilance.

The following experts served on the Committee Dr S Anwar (Indonesia) Dr R Baltazard (Iran) Dr R Devignat (Belgian Congo) Dr R B Heisch (Kenya) Dr Karl F Meyer (USA) Dr B Pastukhov (USSR) and Dr S C Seal (India). Dr M Giacinto (WHO) was Secretary to the Committee while Dr R Pollitzer (USA) acted as consultant.

## Analysing radio-active contamination

As the use of atomic energy is extended the potentiality for radio active contamination

## Changes at WHO Headquarters

Two new sections—the Education in Medicine and Allied Subjects Section and the Public Health Education and Training Section—have been established in the Division of Education and Training Services at WHO Headquarters. They replace the Exchange of Scientific Information Section and the Assistance to Educational Institutions Section.

The Education in Medicine and Allied Subjects Section will aim at linking the teaching of medicine and the teaching of allied subjects more closely and at improving the scientific and teaching standards of the educational staff concerned. Its functions will include conducting essential studies and surveys advising on the establishment or improvement of the appropriate educational institutions assisting in the recruitment of educational staff and observing their progress collecting disseminating and exchanging information on educational and scientific matters assisting regional offices with educational and training projects. The section will work in close co-operation with international scientific and educational organizations.

The Public Health Education and Training Section will have similar functions in connection with the training of professional and auxiliary public health personnel and especially with the post graduate training of medical practitioners in public health. It

will also keep under review directories and reference works of public health importance distribute new documentation to public health institutions and departments and devise training programmes and curricula for personnel concerned with the public health aspects of ionizing radiation.

\* \*

A Special Office for General Medical Research Planning has been established at WHO Headquarters. It is attached to the Office of the Director General. The purpose of the new Office is to facilitate the implementation of a Resolution of the Eleventh World Health Assembly (WHA11.35) requesting the Director General

"(1) to organize and arrange for a special study of the role of WHO in research and of ways in which the Organization might assist more adequately in stimulating and co-ordinating research and developing research personnel

"(2) to prepare a plan on the basis of such study in the furtherance of research for transmission to the twenty third session of the Executive Board and to the Twelfth World Health Assembly with cost estimates."

Dr Erwin Kohn formerly Chief of the Exchange of Scientific Information Section has been assigned to direct the work of the Special Office.

OFFICE OF THE DIRECTOR GENERAL  
WORLD HEALTH ORGANIZATION  
1958 87 32

## People and Places

Dental health survey of the Eastern Mediterranean Region

WHO is at present engaged in on year survey of the prevalence and incidence of dental diseases in the Eastern Mediterranean Region. The following countries will be covered: Ethiopia, Iran, Iraq, Israel, Jordan, Lebanon, Libya, Pakistan, Saudi Arabia, Sudan, Tunisia, the United Arab Republic and Yemen. The dental surgeon in charge of this undertaking is Dr George Allen Newell of the United States.

Dr Newell who was educated at the University of Louisville and Kentucky has been a specialist public health dentist for twenty years. He is a

former Chief Dental Officer of UNRRA (United Nations Relief and Rehabilitation Administration) and comes to WHO from the United States Public Health Service.

### Control of communicable diseases

WHO has undertaken to help the Indonesian health authorities in the control of communicable diseases by introducing modern epidemiological methods and providing general advice on preventive medicine. Dr K. Newell will go to Indonesia in December to take part in this project.

Dr Newell was educated at Otago University, Dunedin, New Zealand and at the London School of Hygiene and Tropical Medicine where he obtained a diploma in public health. His experience includes

B Lorenzo Velazquez (Spain) and Mr J R Nicholls Rapporteur (United Kingdom) The Secretary of the Committee was Dr H Halbach (WHO)

### Cardiovascular diseases and hypertension

In 1955 the WHO Study Group on Atherosclerosis and Ischaemic Heart Disease recommended that WHO convene an expert group to establish uniform criteria for the clinical diagnosis and classification of cardiovascular diseases in a manner that will be applicable to epidemiological and other statistical studies.<sup>1</sup> A WHO Expert Committee on Cardiovascular Diseases and Hypertension met in Geneva in October to discuss this matter

The experts invited to serve on the Committee included cardiologists an epidemiologist a public health administrator and a pathologist They were Dr P W Duchosal (Switzerland) Dr J Groen (Israel) Dr H E Hilleboe (USA) Dr J N Morris (United Kingdom) Professor F Rojas (Chile) Dr D D Rutstein (USA) Professor J S Speransky (USSR) and Professor O Torgerson (Norway) Dr T R Dawber Medical Director of the Framingham Heart Disease Epidemiology Study Mass USA acted as consultant The secretary of the Committee was Dr T S Sze (WHO)

### Public health nursing

The WHO Expert Committee on Public Health Nursing met in Geneva from 6 to 11 October 1958 to discuss the public health nursing functions which are common to all countries and the factors influencing these functions in individual countries e.g the status of women educational opportunities and the national economic situation The administration of public health nursing services and the training of nurses for these services were also discussed

In preparation for the Committee's meeting a questionnaire on the subjects to be discussed was sent to national nursing

associations Replies received from 49 countries indicated that the demand for public health nursing services is increasing and that the duties of the public health nurse are tending to become broader in scope Two problems frequently mentioned in the replies to the questionnaire were the shortage of qualified staff and the inadequate budgets provided for public health nursing

The following were invited to serve on the Committee Miss T K Adranvala (India) Mrs E de Faria Alvim (Brazil) Professor E D Ashurkov (USSR) Miss R Freeman (USA) Miss G Frere (Belgium) Miss A A Graham (United Kingdom) Mrs S Nagano (Japan) WHO was represented by Miss L M Creelman who served as Secretary and by Miss E Hill Miss E Hilbourne (USA) acted as consultant to the Committee

### New health education publication

The International Union for Health Education of the Public—a non governmental organization in official relations with WHO—has recently issued the first few numbers of a quarterly publication entitled *International Journal of Health Education* To quote from a message by Dr M G Candau Director General of WHO published in the first number This periodical fills a very real gap and promises to be a vital instrument in the development of health education in the world Its aim is to facilitate the exchange of experiences ideas and news on health education and to bring to health workers and health education specialists throughout the world practical information which they can use in their work Many of the contributors are closely associated with the health education activities of WHO

The *International Journal of Health Education* is published in French and English editions and the annual subscription is \$3 00 £1 Sw fr 12 or the equivalent in other currencies Enquiries should be addressed to The Editor *International Journal of Health Education* 3 rue Viollier Geneva Switzerland

motor-car battery. This is being tried out for the first time and reports so far received from Dr Perry indicate that the results are extremely successful.

#### Appointments in the Eastern Mediterranean Region

Dr A. A. S. El Hlawani has been appointed WHO Deputy Regional Director for the Eastern Mediterranean. Of United Arab Republic nationality, Dr El Hlawani was educated at the Universities of Wurzburg, Germany and of London and Liverpool, England. Before joining WHO, he was Assistant Under-Secretary of State of the Ministry of Public Health in Cairo, Egypt.

Mr W. A. Darity of the United States has been appointed health education adviser to the WHO Regional Office for the Eastern Mediterranean. Educated at the University of North Carolina, Mr Darity has been WHO Visiting Lecturer in Health Education at the School of Public Health, American University of Beirut, Lebanon, for the past two years.

Dr M. Farooq of India, has joined the staff of the WHO Regional Office for the Eastern Mediterranean as public health adviser on birth control. Dr Farooq attended the Universities of Allahabad and Bombay in India, studied in England at the London School of Hygiene and Tropical Medicine and the Liverpool School of Tropical Medicine. He has also studied

in the United States where he took a course in epidemiology at the Harvard School of Public Health under a fellowship from the Rockefeller Foundation. Before joining WHO, Dr Farooq was Deputy Inspector-General of Medical and Health Services, Hyderabad State, India.

Dr H. B. L. Russell of New Zealand has been appointed public health adviser at the WHO Regional Office for the Eastern Mediterranean. A former Senior Medical Officer of the Ministry of Health, Accra, Ghana, Dr Russell has more recently been adviser to a WHO-assisted public health project in Ethiopia.

Dr A. A. S. Sdky of the United Arab Republic has been appointed WHO epidemiologist with the task of surveying smallpox control services in the countries of the Eastern Mediterranean Region. Educated at the University of Cambridge and the London School of Hygiene and Tropical Medicine, England, and at the University of Cairo, Egypt, Dr Sdky was Director-General of the Cairo Municipal Health Department before joining WHO.

Mr E. Soop of Sweden has been appointed vital and health statistics adviser at the WHO Regional Office for the Eastern Mediterranean. Educated at the High School of Economics, Stockholm, Mr Soop was formerly Chief of the Statistical Section of the Royal Medical Board in Stockholm.

## Review of WHO Publications

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*Principles of Administration Applied to Nursing Service* by H. A. Goddard. Geneva, 1958 (World Health Organization Monograph Series No. 41). 108 pages. Price £1 \$4.00 or Sw fr 12.— French and Spanish editions in preparation.

The lack of qualified nurses in almost every country makes it imperative to utilize the services of those who are available to the best possible advantage. In recent years it has begun to be recognized that one of the keys to the efficient and economical use of nursing personnel is good administration. Since administration is a comparatively new concern of nurses, they feel a definite need for instruction and guidance in the principles

and techniques involved and for training to develop the requisite skills. To help meet this need, the World Health Organization has published a practical guide to administration in nursing service, written by a consultant in hospital management in co-operation with nursing leaders from many countries.

First consideration is given to the principles of administration, then the application of these principles to nursing service is described and illustrated. The emphasis is on proper planning, which is the foundation of good administration. The administration of both hospital and public health nursing services is discussed in detail. A question-naire to aid in evaluating existing administra-



field work among the Maoris in New Zealand research at the Central Public Health Laboratory in London England and lecturing at the Department of Social and Preventive Medicine of Queen's University Belfast Northern Ireland

#### Fellowships for Indian teachers

With the active support of WHO the Government of India has undertaken a special training programme to remedy the almost complete lack of suitably trained teachers of preventive medicine in the country. Five teachers who were awarded WHO fellowships under the programme to study public health at the Harvard Medical School in the United States recently returned to India to take up their duties in university departments of preventive and social medicine. They are Dr M. L. Chugh (Punjab), Dr Henry Moses (Madras), Dr D. K. Ramadwar (Bombay), Dr R. Sharma (Rajasthan) and Dr S. A. Upadhyaya (West Bengal). Under the same programme Dr B. N. Lingaraju (Mysore) completed his training last year while two more Indian teachers—Dr Lakshmi Kant (Bihar) and Dr M. C. Mittal (Madhya Pradesh)—are now studying at Harvard on WHO fellowships.

#### Sanitarian for malaria project

Mr Donald Landeg of the United Kingdom has joined the staff of the WHO assisted malaria eradication project in Cambodia as sanitarian. Mr Landeg who was a sanitary inspector in the Public Health Department London from 1948 to 1952 comes to WHO from the Medical Department of the Nigerian Government where he worked as health superintendent.

#### Research in sanitary chemistry

For some time WHO has been assisting the Faculty of Engineering of the University of Alexandria United Arab Republic with its engineering courses and with the organization of a Centre for Sanitary Engineering Research. Professor J. Carrell Morris Gordon McKay Professor of Sanitary Chemistry at Harvard University has just been appointed WHO consultant in sanitary chemical research at the Research Centre.

A graduate of Princeton University Professor Carrell Morris has had extensive experience of university teaching and of supervising laboratory work in sanitary chemistry in the United States.

#### Nutrition experts visit Ghana

A WHO nutrition consultant Professor B. S. Platt is at present in Ghana to advise the Government on

the establishment of a nutrition unit within the Ministry of Health. He is accompanied by a consultant from the Nutrition Division of FAO.

Professor Platt is Head of the Department of Nutrition at the London School of Hygiene and Tropical Medicine and Director of the Human Nutrition Research Unit of the Medical Research Council of Great Britain. He has been a member of the WHO Advisory Panel on Nutrition for some time and served in 1954 as Chairman of the Joint FAO/WHO Expert Committee on Nutrition.

#### Sanitary engineering in Afghanistan

Mr Dragutin M. Knez of Yugoslavia recently started a WHO assignment as sanitary engineer in Afghanistan. He will act as adviser to the Afghan Government on programmes of rural sanitation, assisting in particular with the establishment of a rural health and training unit at Gulzar. He will also assist municipalities in matters of sanitation and take part in training activities at the WHO sponsored school for sanitarians at Kabul.

Mr Knez received his degree in engineering at the University of Zagreb subsequently specializing in environmental sanitation. Before joining WHO he was Director of the new waterworks station Osijek Yugoslavia.

#### Hospital records

Since May 1957 WHO has been helping the Government of Malaya to re-organize the record system used in Malayan hospitals and to train and supervise local hospital records officers. Mr Eric W. Secombe of the United Kingdom was recently appointed WHO adviser to this project.

Mr Secombe who studied at the City of London Technical College and the Institute of Hospital Administrators London is a member of the Advisory Panel on Medical Records of the King Edward Hospital Fund for London.

#### Biochemistry of insecticide resistance

Much research is still required into the biochemistry of resistance by malaria vectors to certain insecticides. A WHO consultant Dr A. S. Perry from the Communicable Diseases Centre Atlanta Ga. USA is spending two months in Greece Turkey and Italy to investigate the presence of an enzyme known as DDT dehydrochlorinase in resistant strains of *Anopheles*. Research on this problem had previously been confined to the laboratory.

One unusual item in Dr Perry's equipment is a portable ultra violet spectrophotometer run from a

# MALARIA

## Some WHO publications

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### CHEMOTHERAPY OF MALARIA

by Sir Gordon COVELL, G. R. COATNEY, John W. FIELD & Jaswant SINGH  
Monograph Series No. 27, 1955, 123 pages, 10 figures, 14 tables, bibliography, index  
17/6 \$3.25 Sw fr 10.— (clothbound)

*This work by four eminent malarialogists constitutes a critical study of the most recent antimalarial drugs. It covers a very extensive field giving a brief general outline of the history of these drugs and examining the question of resistance to antimalarials. Each of the compounds in common use is analysed as to its chemical structure, activity, toxicity, contra-indications, dosage, absorption and elimination and plasma concentration.*

### MALARIA CONTROL

Bulletin of the World Health Organization, 1954, Vol. 11, No. 4-5, 382 pages, 66 figures, 78 tables  
[Articles in English and French with detailed summary in the other language]  
£1 \$3.00 Sw fr 12.—

*This number makes a valuable contribution to the literature on malaria. It describes the new strategy in malaria control since the development in mosquitoes of resistance to insecticides—a strategy by which early eradication of malaria over vast regions may be anticipated. The work provides a general picture of the present situation with regard to control by means of residual insecticides illustrating the success and limitation of the method and the problems it gives rise to in many countries and territories. Other articles deal with the ineffectiveness of DDT spraying in the Jordan Valley, the effects of suspended residual spraying and of imported malaria in the USA, the resistance of *Anopheles sacharovi* to DDT and to chlordane and the possibility of resistance to DDT by *Anopheles albimanus*.*

### MALARIA TERMINOLOGY

by S. Gordon COVELL, Paul F. RUSSELL & N. H. SWELLENGREBEL  
Monograph Series No. 13, 1953, 8 pages, 8 figures  
5 \$1.00 Sw fr 4.—

*This work is divided into two parts: (1) a commentary on the terms used by malarialogists (excluding terms relating to engineering techniques and insecticide sprayers and the names of antimalarial drugs) and (2) a detailed glossary of those terms.*

tive practices is provided as a guide for nursing administrators who cannot start afresh in their planning. Following this comes a major section on the techniques of administration particularly as they apply to personnel management. Here such matters as job analysis, job specifications, personnel assessment, remuneration, health and welfare programmes for employees and in-service training are dealt with. The approach is a practical one and specific examples of both simple and complex problems and procedures are used as illustrations. A brief concluding

section summarizes the basic tenets of administration.

Seven annexes, some of which contain specimen forms for job analyses, job specifications and personnel assessment and a select bibliography intended to encourage further study of the subject, complete the monograph.

This publication, which is in effect a manual of nursing service administration, should prove useful to all those concerned with the management or instruction of nursing personnel.

### *Sanitary engineers*

Professor Petrik made an extensive survey of European schools and programs and collected a large volume of material by means of personal visits, correspondence and study of the available programs. His study\* covers 16 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Switzerland, Turkey, United Kingdom and Yugoslavia.

In addition, he reviewed sanitary engineering programs in a selected number of American universities.

Professor Petrik has assembled in this monograph information not previously available in one publication. The monograph will be an invaluable reference to everyone interested in sanitary engineering education. It should be on the bookshelf of all agencies which are concerned with providing training grants for graduate work for sanitary engineers. It is well written and can be recommended without reservations.

Herbert M. Bosch in *American Journal of Public Health* 1957 47: 377-378

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PRINTED IN SWITZERLAND

## CARDIOVASCULAR DISEASE OPPORTUNITIES FOR RESEARCH

While the major public health problems of most of the WHO Regions continue to be endemic communicable diseases such as malaria bilharziasis leprosy and yaws public health workers in Europe are able to concentrate their attention on a few seasonal epidemics—such as influenza and poliomyelitis—and on the chronic non infectious diseases. Among these the cardiovascular diseases take pride of place. With a view to stepping up research in this field within the European Region an advisory group on cardiovascular diseases was convened by the Regional Office in April 1958. The meeting which lasted five days was held in Copenhagen and was attended by experts from ten countries.<sup>1</sup> Their views and recommendations are summarized below.

### Con genital heart diseases

As a cause of death the congenital cardiac defects rank low compared with other diseases of the heart. On the other hand they cause prolonged disability and their victims are a burden on their families and on the community. Their importance should not therefore be underestimated.

Modern surgical techniques for the repair of cardiac defects enable the lives of many patients to be prolonged. Paradoxically this raises a number of fresh practical issues for the health services—for example the increased likelihood that these patients will marry and pass on the genetic factors responsible for congenital defects to their children.

Early diagnosis is desirable as even infants with several malformations can be operated on successfully. The paediatric services should therefore work in close co-operation with the maternity hospital as well as with the school medical services and the family doctor. This is perhaps more easily said

than done as many general practitioners have a traditional inclination to work in isolation. Several countries have set up cardiological centres for the diagnosis and treatment of patients with congenital heart disease most of them catering both for children and for adults. It was recommended that similar centres should be established in all countries where such facilities are at present lacking or insufficiently developed. Cardiological centres of this type also provide excellent opportunities for epidemiological studies and other forms of research on congenital heart disease. For instance long term observation of patients with congenital defects would provide information on the natural history of these lesions. Careful history taking might throw considerable light on the relative importance of heredity and of environmental influences to which the mother is exposed such as nutrition infections intoxications and ionizing radiation.

### Rheumatic heart disease

Apart from congenital defects the only form of cardiovascular disease which is a significant cause of death in persons under 35 years of age is rheumatic heart disease. The group regarded its prevention and treatment as a crucial problem in many European countries.

The prevention of rheumatic fever of which rheumatic heart disease may be the sequel was the subject of a report by the WHO Expert Committee on Rheumatic Diseases published last year. As the only established cause of acute rheumatic fever is infection with group A haemolytic streptococci the problem resolves itself into the prevention of such infection. This can be accomplished either with the sulfonamides or with penicillin but penicillin is generally preferred as it is less likely to produce dangerous reactions than the sulfonamides. Never

<sup>1</sup> Belg. m. Czechoslovakia, Denmark, France, I. I. Nether-  
lands, Norway, Sweden, United Kingdom, USSR.



theless the risk of accidents due to sensitization to penicillin is always present. Other disadvantages are the high cost of prolonged treatment and the possible development of strains of staphylococci resistant to penicillin. Although penicillin prophylaxis of relapses of rheumatic fever has previously been recommended by the WHO Expert Committee on Rheumatic Diseases, the Royal College of Physicians in London and the American Heart Association, many physicians seem reluctant to follow this advice. The group thought it desirable that the reasons for this situation should be investigated. It was also recommended that further studies should be undertaken on the efficacy of penicillin therapy in preventing the development of rheumatic heart disease—as opposed to the prevention of relapses—and on the possibility that after treatment is stopped the subjects may be more susceptible to streptococcal infection than they were before. It was felt that the experience so far was sufficiently favourable to justify the encouragement of penicillin prophylaxis in children but that the value of this method in adults had yet to be confirmed.

There is reason to believe that the nature of rheumatic heart disease is changing possibly as a consequence of the new methods of prophylaxis and treatment. This makes it all the more important to intensify research on the epidemiology and natural history of the disease in different countries. The group thought that particular attention should be paid to epidemiological surveys on streptococcal infection in schoolchildren and recommended that steps should be taken to co-ordinate such surveys on an international scale. It would be helpful too if arrangements could be made for the international exchange of the sera required for typing streptococci so that each of the different specialized laboratories need only concern itself with the preparation of a small group of sera.

Several countries still lack adequate facilities for the diagnosis, prevention and treatment of rheumatic heart disease. The advisory group recommended that properly equipped centres specialized in these tasks

should be set up as part of the health services of the countries. Such centres would also conduct research on rheumatic heart disease. In some cases they might be combined with the centres for the diagnosis and treatment of congenital defects and cover the whole field of juvenile heart disease.

The group also discussed the social aspects of rheumatic heart disease in young people and stressed the need for providing such patients with the right sort of education and training so that they would be able to find employment commensurate with their physical capacity. Unfortunately many establishments with large clerical staff are reluctant to employ young people with early valvular disease. It was recommended that a study should be undertaken to find ways of combating this attitude and of making the public aware of its social implications. Some countries have already introduced legislation to ensure the employment of physically handicapped persons and it might be that similar measures could be extended to other countries. Another problem is that of providing home help for housewives with rheumatic heart disease particularly during pregnancy. This might be undertaken by the social welfare departments of the public health services.

### Coronary heart disease

Congenital and rheumatic heart diseases account for a high proportion of cardiovascular mortality only in children and young adults. From the age of 40 years onwards the atherosclerotic and degenerative heart diseases assume increasing importance. Ischaemic heart disease, the principal complication of coronary atherosclerosis, is now one of the leading causes of death in persons of middle age in Europe and many other parts of the world. A recent study in Great Britain has shown that one physician in five develops ischaemic heart disease during middle age.

It is still controversial whether the increase in ischaemic heart disease is simply the result of the increased life expectancy and the reduction in mortality from other causes or

whether it is also due to other factors such as changes in the diet decreased physical activity cigarette smoking and nervous strain It is equally uncertain whether the differences in cardiovascular mortality reported from various countries are real or merely reflect different traditions in clinical medicine with respect to diagnosis and different methods of coding and classifying causes of death<sup>3</sup> To help clarify these problems epidemiological research on a large scale with close international collaboration is called for It was pointed out that investigations of this type are expensive however and that countries might require considerable financial support Specific suggestions included the following

1 A small group of officers from national offices of vital statistics should undertake a comparison of the procedures adopted in different countries for classifying causes of death

2 Representatives of the various European research groups now carrying out epidemiological studies on the cardiovascular diseases should meet together to make suggestions for systematic comparative studies on a number of aspects of atherosclerosis hypertension and ischaemic heart disease For example the chemistry of the blood lipid might be subjected to rigid examination and surveys undertaken to elucidate the etiological significance of heredity dietary habits occupation and other environmental factors An important field of study on which practically no systematic work has been done so far is the role of emotional and psychic factors in the genesis of ischaemic heart disease

3 The attention of government authorities should be drawn to the need for long term prospective studies on large groups of the

population Special provisions may have to be made for such studies as they are expensive and require considerable organization

4 A start might be made on an epidemiological study of atherosclerosis in Europe along the lines laid down by the WHO Study Group on the Classification of Atherosclerotic Lesions<sup>4</sup> The initial aim would be to make an accurate statistical analysis of the prevalence of atherosclerosis in a population by geographical location age and sex and to standardize techniques of examination and description so as to permit international comparison

### Hypertension

It is difficult at present to gauge the true social importance of hypertension or to make comparisons of statistics from different areas since there is no agreement regarding the level of blood pressure that should be diagnosed as hypertension The group emphasized the importance of establishing an agreed definition

Many questions need clarification and the advisory group considered that every effort should be made to encourage research on the pathogenesis pathology and diagnosis of hypertension As in the case of all forms of cardiovascular disease there is a need for an investigation into the relative importance of genetic make up and environmental factors It is known that the blood pressure is raised during emotional stress long term studies should be instituted to determine the relationship between such episodes of temporarily raised blood pressure and the ultimate development of a permanent hypertensive state It was recommended that as an initial step a group of workers actively engaged in research in this field should meet together to discuss these problems



In ten of the countries in the first group more than half the deaths were attributed to arteriosclerotic and degenerative heart disease and in the other two the proportion was more than 44%. A further 25-40% of the deaths were due to vascular lesions affecting the central nervous system while the proportion classified as "other diseases of heart" was less than 10% except in the case of Austria where it was 13%.

Of the countries in the lower half of the diagram Costa Rica Germany Guatemala the Netherlands and Norway showed patterns of this type. In all the other countries less than 40% of the deaths from cardiovascular disease were ascribed to arteriosclerotic and degenerative heart disease and in Colombia France Japan Mexico and Portugal the proportion was less than 25%. Also in great contrast to the distribution in the first group was the proportion of cardiovascular mortality assigned to "other diseases of the heart." Particularly striking in this respect were Belgium (32%) Colombia (40%) France (42%) and Mexico (65%). In Japan on the other hand more than two-thirds of the cardiovascular mortality was attributed to vascular lesions.

The true significance of these wide discrepancies in absolute and relative mortalities cannot be assessed however because facilities for the diagnosis of cardiovascular disease

are often limited and because traditional clinical teaching which varies from country to country largely decides the choice of diagnostic label. It is known for example that in France terms found under the heading "other and unspecified diseases of heart" (434) in the *International Classification of Diseases* are used very frequently but many of these deaths may in fact be due to arteriosclerotic heart disease. It is probable that a similar practice is followed in other countries that are influenced by the French school of medicine such as Portugal Colombia and Mexico. In Japan on the other hand the low proportion of deaths from arteriosclerotic heart disease may possibly be due to the fact that in some cases where death is attributed to vascular lesions—for example cerebral embolism and thrombosis—the underlying cause is arteriosclerosis.

Thus while there is good reason to believe that considerable differences do exist between death rates from cardiovascular diseases in different countries it is evident from this study that the statistics at present available do not provide a true picture particularly with regard to the relative importance of the different sub-groups of cardiovascular disease. The authors stress the need for a careful analysis of the terms used and for an investigation into the underlying causes of death in several countries.

As the foregoing article exemplifies it is often difficult to decide which of several existing conditions should be certified as the primary cause of death. In an article entitled *What is the cause of death?* Carl L. Erhardt Director of the Bureau of Records and Statistics in the New York Department of Health has recently described the process of death certification in a vital statistics office and shown how the validity of mortality statistics is impaired by inadequate certification on the part of the attending physician. He discusses the use of the certificate format adopted by WHO and draws attention to the instructions published by the Organization thus concerning it. He shows in the ultimate analysis, the accuracy of death certification and hence the validity and value of mortality statistics rests on the importance attached by the individual physician to this task.

Finally in some way the physician must be influenced to change his attitude that the death certificate is just a piece of work that is completed on as a last rite for someone no longer of clinical interest that it represents merely a other bit of bureaucratic red tape. The major users of information on death certificates are physicians not only those in public health, but research clinicians, pathologists, and practicing physicians with special interests. The attending physician, therefore in completing the death certificate is fundamentally transmitting information to his colleagues. His respect for them should be adequate incentive to do the job right.

# INTERNATIONAL HEALTH WORK IN THE CARRIBEAN AREA

Same seven years ago the Pan American Sanitary Bureau (PASB) which acts as the WHO Regional Office for the Americas began to decentralize its work setting up Zone and Field Offices in various parts of the Region. The article that follows<sup>1</sup> deals with international health work in those countries in the Caribbean area covered by the PASB/WHO Zone I Office in Caracas Venezuela<sup>2</sup>

In the Caribbean the Zone I Office of PASB/WHO co operates with 24 health departments serving over 7 million people most of whom live on islands. The total land area involved is approximately 190 000 square miles. The major public health

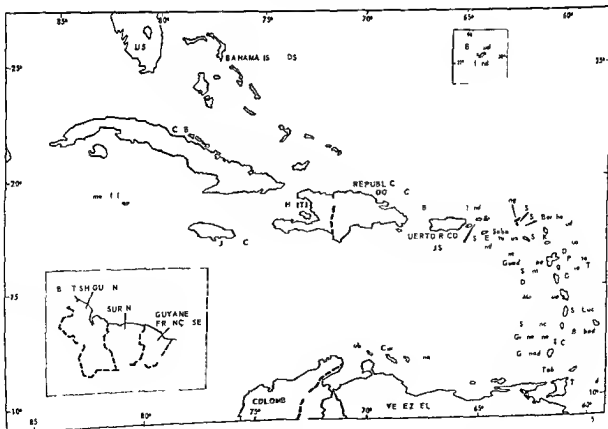
programmes are those aimed at the eradication of *Aedes aegypti* (the urban vector of yellow fever) malaria and yaws and at the control of tuberculosis

## Eradication of *Aedes aegypti*

The eradication of *A. aegypti* is complete and vigilance against re infestation is being maintained in five territories or departments (Aruba Bermuda British Guiana French

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THE CARRIBEAN AREA



Guiana and Grenada) The eradication programmes in Bonaire Curaçao St Lucia and St Vincent are far advanced those in Barbados Carriacou Dominica St Kitts and Trinidad and Tobago are moderately advanced Eradication services are also operating in Antigua the Bahamas Jamaica Martinique Puerto Rico and the United States Virgin Islands while campaigns were recently started in Guadeloupe and Montserrat A *aegypti* eradication programmes have still to be undertaken in the British Virgin Islands the Lesser Netherlands Antilles and Surinam

### Malaria

In a number of the Caribbean islands malaria has been unknown for many years (Antigua Aruba the Bahamas Barbados Bermuda Bonaire British Virgin Islands Curaçao Martinique Montserrat St Kitts Nevis St Vincent and the United States Virgin Islands) Claims of eradication in certain other territories (the Cayman Islands Dominica French Guiana Guadeloupe and Tobago) have still to be checked by evaluation teams

Malaria eradication programmes are in an advanced stage in Grenada and St Lucia The programme in Trinidad is moderately advanced while in Jamaica and Surinam eradication has just started In British Guiana malaria has been eradicated from the coastal areas where 95 / of the inhabitants live and an eradication programme to cover scattered settlements in the interior is about to be organized

### Yaws

The success of the PASB/WHO assisted yaws eradication campaign in Haiti (Zone II)<sup>2</sup> has greatly stimulated the demand for similar campaigns in the Zone I territories and departments of the Caribbean Three years ago in response to requests from governments PASB/WHO established a plan for the eradication of yaws from the area The campaign started in 1956 with operations

in Grenada (90 000 inhabitants) St Kitts Nevis Anguilla (54 000 inhabitants) and St Vincent (76 800 inhabitants) It has since been extended to Dominica St Lucia and Trinidad and Tobago

### Tuberculosis

The Caribbean governments are taking energetic measures against tuberculosis which is one of the most widespread communicable diseases in the area By the end of 1955 WHO and UNICEF had assisted the governments of British Guiana Grenada Jamaica, St Kitts Nevis Anguilla Surinam and Trinidad and Tobago to launch mass BCG vaccination campaigns The number of persons to be tuberculin tested in Surinam — i.e. those aged 25 and under in urban areas and 45 and under in rural areas — was estimated at 150 000 On the completion of the campaign in 1957 72 / of these persons had been tested

A campaign aiming at the coverage of the same age groups started in Barbados in January 1956 and ended in March 1957 Although the total number of persons tested (62 4 / of a possible 120 000) was considerably below that recorded for other islands the coverage in schools was excellent 37 117 children being tested out of a possible 40 038

In the Caribbean area as elsewhere the past ten years have seen a steady decline in the number of deaths from tuberculosis The reduction in the number of new cases has been much less dramatic but in several places the odds seem to be clearly against the survival of the tubercle bacillus and there is hope that the disease will eventually be eradicated

### Other activities

Environmental sanitation is a source of concern to health departments throughout the Caribbean area. A PASB/WHO project for the improvement of water supplies sewage and refuse disposal insect control and housing serves British Guiana French Guiana Surinam and the British, Dutch and

French islands of the Greater and Lesser Antilles Substantial progress has been made in surveying and evaluating environmental sanitation facilities which are extremely inadequate in some places There is no doubt that this problem demands much more attention than it has so far received

A leprosy survey was conducted in British Guiana French Guiana Grenada Guadeloupe Martinique St Lucia Surinam and Trinidad and Tobago in 1955-56 It is to be followed up by visits from consultants who will review and advise on developments in each of these territories and departments since that time At the beginning of 1958 a preliminary survey of smallpox protection in the Caribbean area was undertaken

Programmes for the development of public health laboratories (see next article) and the reorganization of health services are progressing satisfactorily and surveys of public health dentistry and public health nursing have been successfully started

Veneral disease control is a major health problem in the Caribbean area but adequate programmes in this field cannot be carried out as yet owing to a shortage of staff It is hoped that it will eventually be possible to release sufficient staff for this purpose from the mass programmes for the eradication of malaria yaws and *A. aegypti* and the control of tuberculosis

### Training programmes

PASB/WHO assists governments in training national personnel for all the activities mentioned above Particular attention is paid to the training of sanitary inspectors and public health nurses since both these categories of personnel are in heavy demand

The PASB/WHO fellowship programme has proved invaluable and the Organization has been able to use Caribbean staff trained for special health activities in their own territories or departments as consultants to governments in other parts of Zone I

## Leprosy control

More prophylactic trials among child contacts of leprosy cases using small doses of sulfone were urged by the UNICEF/WHO Joint Committee on Health Policy at a recent meeting in Geneva Carefully planned research to reach a final verdict on the value of the BCG prophylaxis of leprosy was also recommended by the Committee

## Insecticide resistance in malaria vectors

WHO is now publishing from time to time in its *Weekly Epidemiological Record* information received in respect of confirmed cases of resistance of natural vectors of malaria to chlorinated hydrocarbon insecticides It is hoped that this information will enable health administrations to take active measures to prevent the spread of the resistant vectors

# THE BARBADOS PUBLIC HEALTH LABORATORY SERVICE

*In the Caribbean as elsewhere the public health laboratory is playing a vital part in programmes against the tropical and other communicable diseases. The article that follows describes the organization and work of a public health laboratory service recently established in Barbados with the co-operation of the Pan American Sanitary Bureau (PASB) which has as the WHO Regional Office for the Americas.*

## Foundation of the service

In 1956 an agreement was signed between the Government of Barbados WHO and UNICEF for the establishment of a central

operations began at the central laboratory. Equipment supplied by UNICEF arrived about the same time. Operations in the branch laboratories began in June 1957.

## Organization

The Barbados Director of Medical Services is in charge of all the island's public health services including the three health centres and the public health laboratories. The PASB/WHO consultant advises him on the work of the laboratory service. The present laboratory staff consists of a supervisor (who is the national "counterpart" to the PASB/WHO consultant), a pathologist and three technicians. The laboratories are financed by the Government and their budgets are controlled by the administrative staff of the health centres.

## Training

From the beginning training has been in the form of practical benchwork without formal lectures or classes. It is believed that this system enables the technicians to learn more in a shorter time. Special emphasis is placed on the technical aspects of the various tests and the interpretation of the results.

All the staff have been trained to perform the qualitative and quantitative VDRL serology tests. As training for parasitological surveys the direct-smear and zinc flotation concentration tests have been taught, and considerable time has been spent on the identification of the various parasites and ova. The service intends to acquire a complete series of slides of fixed preparations of the common ova for reference purposes.



public health laboratory at the Enmore Health Centre, Bridgetown, and two branch laboratories at the Speightstown and Six Cross Roads Health Centres (see map).

In March 1957 a PASB/WHO laboratory consultant started training personnel and



The staff have also been trained in the practical aspects of bacteriological techniques and particularly the isolation and tentative identification of the various bacteria of medical importance. Special attention has been paid to diphtheria and to the gonococcus cultural methods. The dark field test has been taught to the entire staff. More recently there has been increasing emphasis on haematological work.

Training has been completed in such basic laboratory techniques as the preparation of culture media, the preparation and sterilization of glassware and the chemical and microscopic examination of urine.

There has been no division of the different types of laboratory work into sections; all technicians take part in the examination of laboratory specimens so that there is a common interest in every phase of the work.

#### Scope of the work

The volume and scope of the work are already far beyond what was originally anticipated. This is due in the main to the larger numbers of patients attending the Enmore Health Centre—for example in September 1957 laboratory services were requested for some 5200 of these patients.

The diagnostic services of the laboratories are being increasingly used by the public health authorities both for the island community and for installations such as the United States Navy Base. Moreover co-operation with such institutions as the Rockefeller Foundation's Virus Laboratory in Trinidad has resulted in a wider use of the laboratory at the Enmore Health Centre. Thus towards the end of 1957 the laboratory staff at the Centre took part in the collection and processing of blood samples in connexion with a virus disease survey organized by the Trinidad laboratory.

Early in 1958 two other public health surveys were carried out in Barbados with the assistance of the public health laboratory service: a sickle-cell anaemia survey of the patients attending the health centres and a syphilis serological survey of the inmates of the island's eleven almshouses. More recently a combined nutrition, serological and parasitological survey of the island's school children has been undertaken.

To sum up, experience in Barbados has undoubtedly shown how the establishment of an efficient public health laboratory service can lead to a rapid expansion of public health work in general.

## Reports of Expert Groups

### NUTRITION AND DISEASE

Specific nutritional disorders cannot be dealt with in isolation since they are part of a broader pattern of undernourishment and malnutrition. Measures against these disorders will therefore be to some extent ineffective unless they are combined with an effort to improve nutrition standards in general. This point is stressed at the outset in the fifth report of the Joint FAO/WHO Expert Committee on Nutrition<sup>1</sup> which reviews the

relevant programmes of the two organizations since 1954 with special emphasis on protein malnutrition and deficiency diseases.

#### Protein malnutrition

The report deals at some length with the joint FAO/WHO/UNICEF programme in this field which is being carried out in three stages:

(a) collection of information on protein malnutrition including field surveys to ascertain its prevalence in certain areas

<sup>1</sup> Joint FAO/WHO Expert Committee on Nutrition (1958)  
Fifth report (Hid. Hk. Org. t. h. R. p. S. r. No. 149) 55 pages.  
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(b) discussion of the problem by various expert groups

(c) the development and application of preventive measures including the use of protein rich foods other than milk in the supplementary feeding of infants and children

A valuable part in the development of the programme has been played by the Protein Advisory Group established in 1955 to act on behalf of WHO "in rendering advice to FAO and UNICEF on the safety and suitability for human consumption of proposed new protein rich preparations". This Group has met every six months since its foundation and has examined a wide range of problems relating to protein foods. A grant for the research side of the programme was made by the Rockefeller Foundation in 1956 while UNICEF has opened a special fund to procure the requisite food products and to finance technological studies essential to their production.

Six protein sources are now being studied under the joint programme: fish flour, soya beans, peanut flour, sesame flour, cotton seed flour and coco nut. Tested batches of food products from these sources are made available to research groups in under developed areas where their effect in preventing or curing protein malnutrition is studied. In many cases combinations of these food products are used to supplement the staple foods of the areas concerned. If the results are satisfactory steps are taken for the local manufacture of the products.

The Joint Committee agreed that the solution to the problem of protein malnutrition lay in educating mothers to feed their children with enough foods of the right kind and in encouraging national agricultural services to make these foods available in sufficient quantities. Above all, living conditions and standards of health and nutrition generally need to be improved in the countries where the problem exists.

### Beriberi

This disease which is frequently fatal to children appears to be on the increase in a number of rice growing countries in East

Asia where it is associated with the wider use of small mills producing a very highly milled rice deficient in thiamine. The causes of beriberi are fully established and methods of preventing it have been known for more than forty years so that its continuing existence is an anachronism.

The following preventive measures are recommended in the Joint Committee's report: general improvement of the diet to increase its thiamine content; the use of undermilled or parboiled rice; the preparation and cooking of rice in such a way as to preserve its thiamine content as much as possible; the use of synthetic thiamine in rice and other foods. The last of these measures is considered as likely to give the most rapid results.

### Anaemia

Malnutrition is at the root of most of the anaemias which occur in the under-developed and tropical areas of the world affecting in particular expectant and nursing mothers, infants and young children. The factors concerned in the etiology of microcytic hypochromic anaemia which appears to be the most common form of the disease in these areas include a low intake of iron and proteins as well as losses of iron from the body. In the past the disease was often ascribed to the specific effects of hookworm and malaria and the importance of the nutritional factors was underestimated.

The Joint Committee recommended that WHO should convene a Study Group on Nutrition and Anaemias<sup>2</sup> to consider the etiology, detection and examination of the anaemias taking into account not only the nutritional factors involved but also the part played by parasitic diseases and zymotic infections. It also recommended that WHO should encourage pilot studies at maternal and child health centres for the development of preventive measures against the anaemias.

### Eye disorders

Many nutritional deficiencies may cause ophthalmological disease and in a number

<sup>2</sup> See *Chron. Wld Hlth Org.* 19: 12, 387

of countries permanent blindness frequently occurs as a result of avitaminosis A in infancy or early childhood

Two of the principal eye diseases associated with vitamin A deficiency—xerophthalmia and keratomalacia—chiefly affect young children. In fact of the 6142 cases recorded during a recent WHO survey of the two diseases in Indonesia 82.7% were in children 1-6 years of age. As the epidemiological patterns of these diseases vary greatly the Joint Committee urged further research into the relative importance of the many factors which can contribute to the underlying deficiency state.

Programmes for the prevention of vitamin A deficiency should aim at improving the diets of mothers and of infants and children up to 6 years of age. Appropriate foods must be made available to supplement the breast feeding of infants from 4-6 months of age onwards and to provide the basis for a sound diet in the weaning and post weaning periods. In countries where the problem of avitaminosis A is acute it is desirable to supplement the diet of expectant mothers, infants and young children with carotene or vitamin A concentrates.

### Nutrition and infection

Further investigation is needed into the role of infections and infestations in the development of protein malnutrition and the extent to which the occurrence of intestinal infections is itself influenced by a pre-existing state of malnutrition.

Intestinal infestation with nematodes has long been suspected to play an important part in producing malnutrition in young children. It appears for example that *Ascaris* infestation can adversely affect nitrogen balance and the nutrition of the child. *Ascaris* is so widespread a human parasite that further research on this point is indicated.

In Northern Rhodesia WHO is at present investigating the relationship between parasitic diseases and malnutrition in the production of anaemias and the importance of various parasitic diseases as contributory causes of malnutrition. The Joint Committee

recommended that WHO should continue to encourage studies of this type.

### Other subjects

A number of other subjects are considered in the report including the place of nutrition in maternal and child health programmes, nutrition education and the assessment of nutritional status.

The poor nutritional state of the pre-school child is one of the most serious problems confronting maternal and child health workers at the present time. During the first year of life children in many countries receive adequate attention from maternal and child health centres. Later when they enter school they again come under some form of medical supervision. In the intervening years however they lack medical care—and it is precisely in those years that they are most exposed to the hazards of malnutrition and infection. The Joint Committee therefore considered it essential that the activities of maternal and child health centres should be extended to cover the pre-school child. Particular attention should be paid to the provision of expert advice on the use of suitable locally available foodstuffs for feeding weaned children until they can share in the general family diet.

The report notes that facilities for the education of the public in nutrition matters are still far from satisfactory. The role of schools, maternal and child health centres, public health centres, community development programmes, etc. in providing such education is reviewed and it is recommended that FAO and WHO should expand and intensify their work in this field in co-operation with UNESCO and UNICEF.

The Joint Committee also agreed on the need for simple objective indicators which could be used by public health workers with a limited knowledge of nutrition to assess the nutritional status of a population and recommended that expert groups should be convened to study this question.

An annex to the report lists technical assistance projects in nutrition and food technology undertaken by FAO from 1955 to 1958.

## A GUIDE TO VECTOR CONTROL

Since 1956 the phenomenon of vector resistance to pesticides has rapidly developed manifesting itself in an increasing number of species and spreading over wider areas. A co-ordinated research programme organized by WHO with the collaboration of numerous laboratories and investigators in different countries has made it possible to collect considerable information on the subject which will be useful for the more effective planning of eradication and control programmes. This information has enabled the WHO Expert Committee on Insecticides to establish various standard test methods whose application will help to ensure progress in the study of the resistance problem.

The eighth report of the Committee

WHO Expert Committee on Insecticides (1958) 24th report, 1st and 2nd parts, 1 (WHO Hk. Org. Ann. R. p. 5, N. 133) 67 p. Price 3 s. 6 d. Also published in French and Spanish.

describes *inter alia* two standard tests for determining susceptibility or resistance to insecticides: one for use on adult mosquitos and the other for use on mosquito larvae. Also included are details of a provisional method for the bio-assay of insecticide deposits on wall surfaces.

Finally the report contains a general discussion of a number of measures recommended for the control of a whole series of disease vectors—flies, mosquitos, lice, fleas, ticks and other arthropods, rodents, etc. This is the first time that information of this kind—hitherto scattered throughout a mass of scientific literature—has been brought together in a single document for the use of all those who are responsible for organizing or carrying out the eradication and control campaigns at present under way in many parts of the world.

## TOWARDS CLEANER AIR

Over the past fifty years much has been done to ensure safe supplies of drinking water, but little to ensure that the air we breathe is not unduly contaminated by the waste products from heating systems from automobiles and railways and from our vast industrial activities. Yet the weight of the air we breathe in a day is more than ten times that of the water we drink.

It is obviously impracticable in the present state of knowledge to provide at reasonable cost all the necessities and amenities of modern life without causing some pollution of the atmosphere, and the serious effect of contaminated air on health has been dramatically demonstrated in recent years in several fogs or smogs such as those in the Meuse Valley in Belgium (1930) in Donora in the USA (1948) and on several occasions in London. Together these incidents caused the deaths of thousands of people. Long-standing air pollution of a less virulent kind may prove equally harmful in its economic effects and present a more widespread and insidious threat to human well-being.

At the end of 1957 the WHO Expert Committee on Environmental Sanitation decided to consider the health hazards of man-made air pollution and to suggest preventive and remedial action which might be taken by individual countries<sup>1</sup>. The members of the Committee represented four continents and the fields of public health, administration, sanitation, physics, industrial hygiene, fuel research and meteorological research—an indication of the multiple aspects of the problem.

### Evaluation of pollution

Referring particularly to contaminants from industrial and domestic sources, e.g. from fuels and from radiochemical and nuclear processes, the Committee discussed first the question of recognizing and evaluating conditions of air pollution. Contaminants occur as dusts (formed by disintegration

<sup>1</sup> WHO Expert Committee on Environmental Sanitation 1958 Report on air pollution (WHO Hk. Org. Ann. R. Ser. N. 157), 6 pages. Price 1 s. 6 d. Also published in French and Spanish.

processes such as crushing grinding or demolition) fumes (generated by the condensation of vapours and resulting from sublimation distillation or chemical reactions) minute liquid droplets (generated by condensation) sprays (created by some mechanical disintegration processes) and gases. Smoke has long been an acknowledged nuisance but it is only recently that the threat presented by organic compounds from incomplete combustion products of industry automobile traffic incineration of wastes and evaporation of gasoline has been recognized. Not only do these pollutants cause damage to vegetation including valuable crops but certain combinations of them may affect man in ways which vary from a simple watering of the eyes to a congestion of lung tissues. Expanding industrialization in many countries naturally brings with it an increase in the use of fuel and a demand for the development of nuclear sources of energy—a situation which increases the potential health hazards from polluted air and in particular raises the new problem of radio active effluents.

Methods of evaluating pollution are still immature it is a question not merely of devising more efficient ways of measuring the concentration of contaminants (some of which are no doubt still to be discovered) but of taking into account many meteorological and physiographical factors of which the mechanics require much further exploration. Wind flow which largely governs the movement of contaminants varies both diurnally and seasonally air turbulence functions in relation to the wind strength and to the stability of the atmosphere which in turn is influenced by temperature inversions. Thus instead of being dispersed and diluted polluted air may tend to be trapped in layers which are often still further confined by features of terrain such as narrow valleys or by the proximity of high buildings. Even natural dispersal and dilution however would not prevent the gradual building up of a polluted lower atmosphere which eventually could no longer be tolerated by man were it not that precipitation periodically provides the cleansing agents of rain and

snow to remove both particulate and gaseous contamination. More information is required on the factors affecting air movement in localities of different types and reliable air sampling procedures must be devised to deal with smoke dust chemical aerosols gases and radio active substances. For this quantitative methods of chemical analysis and often complex instrumentation may be needed—but whatever the evaluation techniques used it is of primary importance that they should be internationally standardized and that general agreement should be obtained on terminology for reporting purposes.

### Effects

As yet the effects of pollution on human health (and indeed on animals vegetation and the economy in general) are too little understood for desirable limits of concentration of contaminants to be established. To achieve this very necessary aim laboratory investigation of suspect substances should be greatly expanded and specific epidemiological research should be carried out on those diseases (such as chronic bronchitis and lung cancer) thought to be causally related to air pollution. International accordance being sought on the relevant clinical and statistical terms. Animal and botanical studies may be particularly valuable both for their intrinsic economic importance and even more as a source of guidance on parallel human susceptibility. An interesting aspect of the investigations on plants is that not only can they provide information on the chemical nature of air pollutants and on the duration of their cumulative effects but certain species might actually be used as alarm signals of potential danger to health before clinical symptoms are noted.

### Control

Much of the air pollution which now exists could be prevented without undue cost and sometimes even with a financial saving by careful planning and siting of factories and dwellings better design of equipment and better operation of equipment based on

adequate training of management executives and operators. The reduction of the waste products from certain combustion and manufacturing processes, mitigation of their effects by consideration of the meteorological and topographical factors referred to earlier and careful control by technically qualified operators of all plants likely to emit undue quantities of pollutants are measures urgently required in many areas.

The administration of a control programme must be based upon the concept that clean air is attainable to the extent that the community concerned is willing to pay for it; education of the public would do much to facilitate the activities of the control authority. New legislation will be necessary to provide for a workable control organization and since the movement of air masses knows no jurisdictional boundaries, the area supervised by this body cannot be confined within the limits of conventional governmental units. At a national level, however, it is proposed that advice on the establishment of such legislation might be obtained from committees representing the interests of

public health administration, fuel usage, industrial hygiene, agriculture, science, industry and town planning. WHO could offer valuable assistance by analysing the various forms of legislation already developed by certain countries and by disseminating fresh information as it became available on advances in abatement methods, unsuspected forms of pollution and new health hazards. The Committee lays some stress on the desirability of suppleness in the legislation so that rigidly fixed standards of pollution limits should not be outdated by improvements in industrial and technical performance nor alternatively act as a brake on the development of new processes. The control organization itself might best be placed primarily in the hands of existing public health departments but it should be administered by officials who have received specialized technical training while the various aspects of each country's effort should be supervised by national advisory councils on air pollution specially appointed to appraise the problem as a whole and to give general assistance to the central administration.

## *Notes and News*

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### **Regional Committee for Africa**

The eighth session of the WHO Regional Committee for Africa was held in Monrovia, Liberia, from 22 to 26 September 1958. It was attended by representatives of 11 Member States and Associate Member States of the Region. The United Nations, UNICEF and several non-governmental organizations were also represented. Dr M. G. Candau, Director General of WHO, was present for part of the session.

The following officers were elected by the Committee: Dr J. B. Titus (Liberia), Chairman; Dr L. P. Aujoulat (France), Vice-Chairman; Dr W. Delfontaine (Belgium) and Dr H. M. S. Boardman (Sierra Leone), Rapporteurs.

Dr F. J. C. Cambournac, WHO Regional Director for Africa, stated in his report that there had been a greater expansion of regional activities between 1 July 1957 and 30 June 1958 than in any previous year. The training of personnel continued to have high priority and in the year under review a total of 128 fellowships had been awarded to health personnel from the African Region.

The communicable diseases were still the Region's biggest health problem. Twelve million people had so far been examined in yaws campaigns and 7 million cases of yaws had been cured. More than 50 000 persons in the Region had been examined by WHO tuberculosis survey teams and a mass chemoprophylaxis campaign against tuberculosis was being started in Nairobi, Kenya.

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### Control

Much of the air pollution which now exists could be prevented without undue cost and sometimes even with a financial saving by careful planning and siting of factories and dwellings better design of equipment and better operation of equipment based on

A budget of \$3 600 000 was approved for the Pan American Health Organization for 1959. Provision was also made for the use of some \$1 700 000 from the regular budget of WHO. A further \$5 300 000 are expected to be available in contributions from United Nations Technical Assistance funds, the PAHO Special Malaria Eradication Fund and other sources. These sums will be used to assist public health administrations in the Region in an estimated 215 health programmes which are either already in operation or planned for the coming year. The programmes—in particular those concerned with malaria eradication and maternal and child health—will also receive assistance from UNICEF in the form of supplies and equipment.

Dr Fred L. Soper, Director of the Pan American Sanitary Bureau, presented a report on the Bureau's work during the past four years and a Summary of Four Year Reports on Health Conditions in the Americas. Prepared by PASB on the basis of data supplied by Member States, the latter is the most comprehensive statistical survey of health conditions yet to be compiled for the Region.

The progress of malaria eradication in the Americas since the launching of the present eradication programme in 1954 was the subject of another report presented to the Conference. By 31 July of this year national malaria eradication programmes were in operation or planned in all but two of the countries in the Region where the disease still exists. In a resolution on the subject the Conference urged Member States to increase their efforts co-ordinating their eradication programmes as far as possible, particularly in border areas. Appreciation was expressed for the co-operation of UNICEF in this sphere.

*Aedes aegypti*—the urban vector of yellow fever—has now been eradicated from eleven countries and territories of the Americas. The Conference appealed to the countries of the Region which are still infested with this mosquito to intensify their eradication campaigns.

The Conference urged the governments of countries where smallpox still exists to carry

out nation-wide campaigns for its eradication and requested the co-operation of Member States in supplying smallpox vaccine and giving technical advice in this connection. Governments were also asked to carry out intensive surveys on nutritional conditions, the enrichment of foods and the exchange of basic food products.

The question of the proper control of food and drugs was considered by the Conference which asked Member States to authorize the importation only of such food, drugs and therapeutic products as were authorized for domestic consumption in the importing countries. A day of the Conference was set aside for technical discussions on the topic "The prevention of accidents in childhood."

The Conference accepted the invitation of the Argentine Government to hold the XVth Pan American Sanitary Conference (fourteenth session of the WHO Regional Committee for the Americas) at Buenos Aires in the autumn of 1962.

#### Regional Committee for South East Asia

The eleventh session of the WHO Regional Committee for South East Asia was held in New Delhi, India, from 24 to 30 September 1958. Delegates were present from 8 countries. The United Nations, UNICEF, FAO and other intergovernmental organizations were represented, together with several non-governmental organizations. The following officers were elected: Lt Col Jaswant Singh (India), Chairman; Dr Raghubar Baidya (Nepal), Vice Chairman.

In his report for the period August 1957–July 1958, Dr C. Mani, WHO Regional Director for South East Asia, stated that the year had witnessed a certain slowing up in the development of public health services in the Region. This must, however, be considered as no more than a temporary setback for people in South East Asia—an area often considered unfairly as "resistant" to scientific medicine—now fully realizing the benefits of modern public health services and were demanding an increasing share of them.

Nevertheless, the difficulties should not be minimized. There was still an acute shortage



About half the leprosy cases in the Region were under treatment and the antileprosy campaign in the Belgian Congo French Equatorial Africa French West Africa Ghana and Nigeria would shortly be extended to Sierra Leone and Gambia

An encouraging feature of the year's antimalaria work in Africa was that although vector resistance to dieldrin and BHC had been reported from several parts of the Region no case of resistance to DDT was observed, even in *Anopheles gambiae*. Encouraging results in the treatment of malaria with chloroquine had been reported from French West Africa and more than forty small pilot projects were trying out medicated salt as a malaria suppressive

While the vector of onchocerciasis had been eradicated from Kenya and Uganda there were still about 20 million people in the Region suffering from the disease. Bilharziasis was particularly prevalent in East Africa and the situation had been aggravated by the extension of irrigation and drainage systems. Smallpox was still a problem in some parts of the Region

During the period under review the governments of the Region had been making special efforts to improve environmental sanitation and maternal and child health services. Large scale nutrition surveys were being carried out in co operation with FAO

The Regional Committee endorsed a revised programme and budget for 1959, and the proposed programme and budget for 1960. These budgets of about \$3 700 000 and \$4 000 000 respectively include allocations from the regular WHO budget and contributions anticipated from United Nations Technical Assistance funds and from UNICEF. In addition antimalaria work in the Region will benefit from allocations from the Malaria Eradication Special Account amounting to \$446 000 for 1959 and \$781 000 for 1960

The subject of this year's technical discussions was Community development and the health component. From the papers presented and the ensuing discussions it was apparent that there was wide divergency of opinion concerning the place of health in

community development programmes. Some participants considered health improvement to be only one aspect of these programmes while others argued that it was their principal aim. It was agreed that health educators working in community development programmes should if possible be of the same race and culture as the communities concerned and that they should direct their efforts particularly towards children in schools and women attending maternal and child health centres

The Committee decided to hold its tenth session in Accra, Ghana, in September 1960. The ninth session is to be held in Nairobi, Kenya

#### Regional Committee for the Americas

The XVth Pan American Sanitary Conference which was held at San Juan, Puerto Rico, from 21 September to 3 October 1958, served also as the tenth session of the WHO Regional Committee for the Americas

The participants in the Conference included representatives of 19 American republics and of 3 European governments with territories in the Americas. Canada was represented by an official observer and observers were also present from a number of governmental and non governmental organizations. The Conference was attended by Dr M G Candau, Director General of WHO

Dr Guillermo Arborea (Puerto Rico) was President of the Conference. Dr Hector Virgilio Noblia (Argentina) and Dr Alejandro Jimenez Arango (Colombia) were Vice Presidents. Dr Abraham Horwitz (Chile) was elected Director of the Pan American Sanitary Bureau to succeed Dr Fred L. Soper whose third four year term of office ends on 31 January 1959. The appointment of Dr Horwitz as WHO Regional Director for the Americas will be proposed at the next session of the WHO Executive Board

The Conference voted to change the name "Pan American Sanitary Organization" to "Pan American Health Organization". The name of the Organization's executive body—the Pan American Sanitary Bureau (PASB)—which serves as the WHO Regional Office for the Americas—remains unaltered

discussions at the 1959 session of the Committee would be. The role of immunization in communicable-disease control."

### Regional Committee for Europe

The WHO Regional Committee for Europe met for its eighth session from 3 to 6 September 1958 in Monaco. Representatives were present from 26 Member States of the Region from UNICEF, ILO and other intergovernmental organizations and from a number of non governmental organizations.

The Committee elected the following officers: Dr E. Boeri (Monaco) Chairman; Mr W. H. Boucher (United Kingdom) First Vice Chairman; Dr B. Doubek (Czechoslovakia) Second Vice Chairman; Dr O. P. Hjaltestad (Iceland) Rapporteur.

The Committee heard a tribute to the memory of the late Professor Andrija Štampar, President of the First World Health Assembly, and a statement by Dr M. G. Candau, Director General of WHO, who noted with satisfaction the evolution of health activities in the European Region and the impressive number of conferences, seminars and training courses sponsored by the Regional Office.

Introducing his report on regional activities from 1 July 1957 to 30 June 1958, Dr Paul J. J. van de Calseyde, WHO Regional Director for Europe, warmly welcomed the representatives of Czechoslovakia which had resumed active membership in the Organization in January 1958. He went on to stress the following points: the rapid expansion of the regional programme and the consequent expansion of the Regional Office, both on the technical and administrative sides; the importance of the Fellowship Section of the Regional Office which had the responsibility of placing fellows not only from Europe but from other regions dealing with approximately 50 of all the fellowships granted by the Organization as a whole; the co-operation maintained with the United Nations, its specialized agencies and other inter governmental agencies in Europe; the development of newer activities including work on chronic diseases,

cardiovascular diseases, cancer, virus infections and dental health in childhood.

In the ensuing discussion certain differences of approach to the regional programme were apparent. Some participants considered that, as technical solutions for many health problems were now well known and could be applied by the public health services, the Regional Office should concentrate on such problems as the effects of radiation on the organism, ageing of the population, cancer and degenerative diseases. Others thought that there was still much to be done in the traditional fields of maternal and child health, communicable disease control, mental health, etc. All united in stressing the importance of assistance to public health and other training institutions by every available means.

The proposed programme and the budget estimates for 1960 which were endorsed with certain amendments, provided for an allocation of \$1 389 000 from the ordinary WHO budget to be supplemented by \$415 000 from United Nations Technical Assistance funds and \$1 180 000 in supplies anticipated from UNICEF for joint programmes.

The Committee expressed the hope that as many Member States as possible would contribute to the Malaria Eradication Special Account. Neighbouring countries were urged to co-ordinate malaria eradication and surveillance measures in border areas in order to prevent the re introduction of malaria.

In a resolution on the subject of smallpox, the Committee noted that the disease had been imported into several European countries in recent years and stressed the importance of continuing widespread vaccination pending its world wide eradication. Member States were requested to increase their production of dried smallpox vaccine and to make surplus supplies available to other countries where endemic foci still existed.

The technical discussions dealt with "Co-laboration between scientific, administrative and educational bodies in improving health services." There was general agreement that research into the administrative aspects of health planning should be encouraged and that research workers should be specially trained for the purpose. It was also agreed

of trained and even semi-trained health personnel while training programmes were often neither well planned nor well executed. Moreover a number of projects formerly assisted by WHO were showing signs of deterioration owing to the gradual disappearance of local facilities and resources. Finally the state of environmental sanitation throughout the Region (see below) remained highly unsatisfactory partly from lack of funds and partly from lack of driving force to improve existing conditions.

During the period under review WHO had assisted 136 health projects in the Region. As in previous years the main emphasis had been on the control of communicable diseases, the development of rural health services and the training of personnel.

In the field of malaria all countries in the Region had switched over from a policy of control to one of eradication. A national tuberculosis control programme was being started in India and the Madras research project on tuberculosis chemotherapy was shortly expected to yield important results. There had been good progress in leprosy control particularly in Thailand but yaws control had not progressed as well as expected and eradication of the disease was not yet in sight. In India and Indonesia pilot projects for the control of trachoma had given good results.

The Regional Conference on Rural Health held in New Delhi in October 1957 will undoubtedly form an important milestone in the development of rural health services in the Region. Certain rural health projects in India had made appreciable progress under the national community development programme and plans for expanded rural health services were under consideration in Indonesia and Thailand. The rural health project in Chaurassia Afghanistan was now well staffed and equipped.

Assistance to health schools and nurses training institutions had continued. The school for sanitarians in Kabul Afghanistan and the school for health assistants in Kathmandu Nepal had made excellent progress and had become permanent features of the national health services. Progress was

also noted in the fields of maternal and child health statistics, health education and the training of mental health workers.

The proposed programme and budget for 1960 provided for expenditures of \$1 498 000 from the regular WHO budget, \$2 353 000 from United Nations Technical Assistance funds and \$5 187 000 in contributions from UNICEF. Subject to certain modifications these estimates were endorsed by the Committee.

The Committee approved a proposal to set up a regional centre for the classification and study of diseases and recommended the establishment of epidemiological units in national departments of health. It was agreed that it would be advantageous for institutions in the Region providing training in preventive and social medicine to exchange personnel and to pool experience and the Committee asked the Regional Director to facilitate initiatives of this type.

Satisfaction was expressed at the progress in malaria eradication in the Region. Member States were asked to contribute to the Malaria Eradication Special Account and to encourage subscriptions to this fund from other sources. The Committee expressed its support for a smallpox eradication programme in the Region and urged Member States to undertake systematic vaccination and revaccination programmes using and reinforcing all possible measures including legislation to obtain total coverage of the entire population.

The Committee also studied a report by the Regional Office on environmental sanitation in South East Asia and passed a resolution advocating the development of programmes concentrating on the provision of potable water supplies and adequate excreta disposal facilities.

Three meetings were devoted to technical discussions on the theme "Health aspects of community development programmes". The following points were given special emphasis: planning and organizing health services for a community development area; difficulties in establishing these services; training of personnel; evaluation of progress. It was decided that the subject of the technical

discussions at the 1959 session of the Committee would be "The role of immunization in communicable disease control"

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in the Eastern Mediterranean countries as irrigation projects developed. The incidence of poliomyelitis had also increased in certain countries of the Region and the Iraqi Government had asked for WHO assistance in a serological survey on which a poliomyelitis vaccination campaign would be based.

During 1957-58 smallpox broke out in Eritrea, Ethiopia, Iran, Iraq, Pakistan, Saudi Arabia and Sudan. The Regional Office was helping Member States in programmes for producing dried smallpox vaccine and would shortly conduct a survey on anti-smallpox measures in the Region.

In the discussions on the Regional Director's report participants in the meetings mentioned a number of points to which they considered special attention should be paid. These included health education, environmental sanitation, training of personnel for antimalaria and rural health work, extension of maternal and child health and nutrition programmes, training of statistical staff, blood banks, speedier reporting of epidemiological information by governments. Both Sub-Committees noted with satisfaction the greater number of inter-country and inter-regional programmes being undertaken for the strengthening of national health services and for the co-ordination of activities between the Member States of the Region.

The two Sub-Committees endorsed the proposed programme and budget for the Eastern Mediterranean Region for 1960. In addition to an allocation of \$1 641 000 from the regular WHO budget, provision is made for the use of \$1 434 000 from United Nations Technical Assistance Funds and \$7 665 000 in other extra-budgetary funds. The last sum includes contributions from the Malaria Eradication Special Account and the assistance which it is expected that UNICEF will make available to the countries of the Region in the form of equipment and supplies.

Technical papers on antimalaria programmes, smallpox control, drug addiction, WHO-assisted tuberculosis control programmes and vital and health statistics services in the Region were studied by the two Sub-Committees, both of which agreed that

although progress had been made, additional effort and continued WHO assistance were required in all these fields.

The technical discussions at both meetings were on the subject of bilharziasis, which after malaria is the most important single public health problem in the Region. Both Sub-Committees urged that the countries of the Region should include bilharziasis control measures in their plans for raising national living standards and emphasized the need for research on the basic factors involved in the epidemiology of the disease. It was recommended that national programmes against bilharziasis should include pilot projects for the testing of new methods and that special attention should be paid to the development of evaluation and organizational procedures and of objective criteria for the measurement of progress. The Sub-Committees also recommended that representatives of public health, irrigation, public works, agriculture, fisheries and community development departments should form committees or councils to deal with the disease. It was decided that Sub-Committee A of the 1959 session would hold technical discussions on the subject of ancylostomiasis. Sub-Committee B will discuss poliomyelitis at next year's session.

Sub-Committee A will hold its 1959 meeting in Alexandria, United Arab Republic, and its 1960 meeting in Tunis. Unless invitations are received from participating governments, the 1959 meeting of Sub-Committee B will be held at WHO Headquarters, Geneva.

#### Regional Committee for the Western Pacific

The WHO Regional Committee for the Western Pacific held its ninth session in Manila, Philippines, from 26 September to 2 October 1958. The session was attended by representatives from 15 countries in the Western Pacific Region and from 20 international organizations including the United Nations, UNICEF and the South Pacific Commission. The Committee elected the following officers: Dr H. E. Downes (Australia), Chairman; Dr Rya Ozawa (Japan), Vice-Chairman; Dr Tan Hor Kee

that medical students should be familiarized with the full range of medical responsibilities and interests and that medical faculties should include teachers capable from personal experience of providing instruction in the administration of medical services

It was decided that the subject of the technical discussions at the ninth session would be Mental health—its place in the public health programme

The Committee confirmed its acceptance of the invitation to hold its ninth session in Bucharest in 1959 and decided to hold its tenth session in Copenhagen in September 1960

### **Regional Committee for the Eastern Mediterranean**

Because of the unwillingness for political and diplomatic reasons of certain Member States of WHO in the Eastern Mediterranean Region to attend meetings at the regional level with one other of the Member States it was decided in 1953 that the Regional Committee should carry out its duties through two sub-committees. While one of these sub-committees has met annually since that date it has not been possible until this year to arrange for both sub-committees to meet

Sub Committee A of the eighth session of the WHO Regional Committee for the Eastern Mediterranean met in Baghdad Iraq from 12 to 18 October 1958. Thirteen Member States were represented at the meeting namely Ethiopia France Iran Iraq Italy Lebanon Libya Pakistan Saudi Arabia Sudan Tunisia the United Arab Republic and the United Kingdom. A number of governmental and non governmental organizations were also represented. Dr Sabih Al Wahbi (Iraq) was elected Chairman. Dr Said El Dajany (Libya) and Mr Y Tseghe (Ethiopia) were Vice Chairmen.

Sub Committee B of the same session met in Geneva from 22 to 25 September 1958. The meeting was attended by representatives of the following countries: Ethiopia France Iran Israel Italy and the United Kingdom. The United Nations was represented by the

Director of the Division of Narcotic Drugs and observers were present from several non governmental organizations. The Sub-Committee elected the following officers: Dr M Faris (Iran) Chairman, Mr Y Tseghe (Ethiopia) Vice Chairman. The rules of procedure as adopted by Sub Committee A at the seventh session of the Regional Committee were adopted as the rules of procedure for Sub Committee B.

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In his report on regional activities from 1 July 1957 to 30 June 1958 which was presented to both Sub Committees Dr A H Taba WHO Regional Director for the Eastern Mediterranean stated that more than 130 WHO assisted projects were in operation or planned in the Region and that over 1000 WHO fellowships had been awarded to health workers from the Eastern Mediterranean countries since 1949 including 196 in 1957 alone.

Of the 191 million inhabitants of the Region 145 million were still under risk of malaria. The disease had been eradicated from Aden, Cyprus and the Gaza strip and in the year under review eradication campaigns in Iran, Iraq, Israel, Lebanon and the United Arab Republic (Province of Syria) had protected 13.5 million out of 20.5 million persons living in malarious areas.

Tuberculosis was becoming increasingly serious in the Region and had spread to a number of rural areas hitherto free from the disease. A team of experts was to visit all the countries of the Region to study the prevalence of tuberculosis and its epidemiological characteristics. A mass BCG campaign was in progress in Pakistan where more than 25 million persons had undergone tuberculin tests and 9 million had been vaccinated. The value of chemotherapy as applied to two types of tuberculosis patients—those treated in hospital and those treated at home—was being tested in a pilot project in Tunisia.

The Regional Director also spoke of the increasing concern of the Regional Office with bilharzia, which was tending to spread

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The Anti Opium Law banned opium production and established measures to regulate the importation of the drug. It placed responsibility for the treatment of addicts on the Ministry of Health. Of the thousands of persons who voluntarily came forward for treatment most were treated outside hospital and the remainder in general hospitals or special establishments set up for the purpose. The method of treatment generally used was rapid reduction of the opium intake by the controlled administration of opium pills to both in patients and out patients at a later stage methadone was used instead of opium for in patients. For the first day or so all patients were given enough opium or methadone to control withdrawal symptoms. The intake was then reduced rapidly over a period of 13 weeks.

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The annual report of Dr I C Fang Regional Director for the Western Pacific covered the period 1 July 1957 30 June 1958 Dr Fang noted a growing interest in comprehensive rather than specialized health programmes throughout the Region and an increasing awareness of the importance of health planning While the shortage of trained medical and auxiliary staff remained a handicap there was a growing realization of the need for more trained national counterparts to take over the operation of health projects when the international staff left During the period under review 80 fellowships had been awarded by the Regional Office under its regular and technical assistance programmes

Governments were being encouraged to intensify their antimalaria programmes so that they might be able to switch over from the control of the disease to its eradication An expansion of these programmes was anticipated thanks to contributions from the Malaria Eradication Special Fund and progress was being made in the coordination of programmes in neighbouring countries

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The programme and budget estimates endorsed for 1960 provide for the financing of health activities in the Region by allocations of \$1 385 000 from the WHO regular budget \$756 000 from United Nations Technical Assistance funds \$1 492 000 from the Malaria Eradication Special Account and \$251 000 from other extra budgetary funds The Regional Director was authorized to establish priorities among the various health projects on the programme taking into account *inter alia* the place of each

project in the long term health plans of the country concerned and its value to neighbouring countries and the Region as a whole

The Committee endorsed the recommendation of the Eleventh World Health Assembly that the population of all countries where endemic foci of smallpox exist should be vaccinated against the disease during 1959 60 and stressed the need for well trained staff for this purpose

The subject of the technical discussions was Malaria control and eradication As antimalaria programmes throughout the Region were expanding the participants agreed that it was essential to continue the organization of training courses for workers in this field The importance of obtaining the co-operation of the public in antimalaria programmes by means of health education was emphasized In a resolution the Committee drew attention to the dangers of neglecting the administrative side of antimalaria programmes The subject of next year's technical discussions will be The control of tuberculosis

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### Studies in laboratory diagnosis

Countries engaged in building up health laboratory services are faced with a choice of diagnostic methods that may prove embarrassing Methods developed in technically advanced countries are not always suitable for application in those less favourably placed in regard to trained personnel equipment or financial resources With the object of providing guidance for public health authorities WHO has begun publishing in the Bulletin a series of studies on the laboratory diagnosis of various diseases which it is hoped will later be revised and brought up to date for publication in monograph form In an effort to ensure that the diagnostic methods recommended are as internationally representative and acceptable as possible WHO has secured the co-operation of a number of experts from different countries to

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the marked reduction in the number of cases of acute opium poisoning with suicidal intent. In one city there were 4 cases a week of suicide or attempted suicide by opium poisoning now the rate is 1 per month. In another city there were 3 cases a day now there is 1 a week. Moreover there has been no increase in suicide attempts by other methods.

It is not anticipated that opium addiction will ever be completely eradicated in Iran. The hard core of addicts will no doubt continue to find ways of obtaining the drug and their treatment will be especially difficult. The general programme of treatment may therefore have to be revised so as to provide for the prolonged hospital care of the remaining addicts followed by medical and social after care.

#### *Planning health services in the Americas*

The growing emphasis on health planning in the Americas was reflected in the technical discussions at the 1956 and 1957 meetings of the Pan American Sanitary Organization which dealt respectively with the preparation of national public health plans and with the evaluation of health programmes. Both discussions made it clear that the solution to a number of public health problems in the Region lies in the establishment of integrated — i.e. co-ordinated and unified — health services.<sup>1</sup>

From the beginning the Pan American Sanitary Bureau (WHO Regional Office for the Americas) has stressed this idea of integration in its field projects for the development of health services: the first of which was started in El Salvador in 1950. By the end of 1957 PASB/WHO integrated health projects were in operation in Argentina, Bolivia, Colombia, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.

The PASB/WHO field team usually consists of a medical officer, a public health nurse and a sanitary engineer who work in co-

operation with a national team. Originally governments were helped to set up demonstration projects embracing the principal health services required by the community. Professional and auxiliary staff trained at these projects were subsequently assigned to local health services in other parts of the country.

More recently however national health authorities have been requesting help in the planning and reorganization of public health services at the national as well as the local level. Nine PASB/WHO projects are now providing such help (Bolivia, Colombia, Dominican Republic, Ecuador, Guatemala, Honduras, Panama, Paraguay and Peru). In seven of these national planning committees or similar bodies have been established.

The training of staff forms an important part of all these projects which have provided courses for medical officers, nurses, nursing auxiliaries, sanitary inspectors, public health dentists, laboratory technicians and social workers. Fellowships for studies abroad have been awarded to national staff working in the projects.

Finally to assist governments in planning and developing their health services PASB/WHO has prepared or is preparing guides on all major aspects of this work covering such subjects as the reporting of communicable diseases, smallpox vaccination, public health laboratory standards, etc. Some of these guides have been published and others have been released to governments: they are constantly revised as newer knowledge becomes available.

#### *Tuberculosis training course*

The ninth in a series of international training courses sponsored by the Turkish Anti-tuberculosis League with the co-operation of the Turkish Ministry of Health and WHO was held in Istanbul from 8 to 27 September. It was attended by 23 physicians and 12 public health nurses from 14 countries and territories: France, Iran, Israel, Italian Somaliland, Jordan, Lebanon, Libya, Madagascar, Mozambique, Poland, Spain, Tunisia, Turkey and Yugoslavia.

As in previous courses of the series the main emphasis was on epidemiology health education and the medico-social preventive and public health aspects of antituberculosis work. Instruction was in two languages French and Turkish.

Professor Tevfik Saglan and Dr Ismail Gökçe were in charge of the course which was given by three experts provided by WHO: Dr Etienne Berthet, Director General of the International Children's Centre, Paris; Dr Alice Lotte, Chief of the Tuberculosis Section of the National Institute of Hygiene, Paris; and Mlle Yvonne Turpin, Chief Welfare Officer at the Ministry of Public Health and Population, Paris.

#### Regional meeting on nutrition

There is little information available on food consumption and the state of nutrition in the Eastern Mediterranean countries; moreover, nutrition programmes in these countries are handicapped by a shortage of staff.

A regional meeting to consider these and related problems was convened by FAO and WHO in Cairo, United Arab Republic, during November. Some 30 participants were invited from the following countries and territories: Iran, Italian Somaliland, Iraq, Jordan, Lebanon, Libya, Morocco, Pakistan, Sudan, Tunisia, United Arab Republic and Turkey.

The meeting reviewed the nutrition problems of the participating countries and territories and discussed the possibility of organizing nutrition surveys in the Region. Methods of training both medical and non-medical workers for nutrition programmes and the question of setting up national nutrition organizations were also examined.

#### The status of the public health engineer

The role of the public health engineer within a national health administration was discussed at the eleventh session of the WHO Regional Committee for South East Asia in September. Since his aim in designing, constructing, operating and supervising sani-

tary works is to strengthen the public health services, his duties cannot be considered simply as those of a works engineer. On the other hand, he cannot be considered as coming wholly under the jurisdiction of the health administration, particularly as health laws and regulations are generally distinct from—and sometimes incompatible with—those governing engineering practice. This uncertainty as to the proper status of the public health engineer is a serious obstacle to efficient health planning and an issue that must be faced.

Other problems discussed were the lack of collaboration and mutual understanding between the medical and engineering professions, the salaries and grading of public health engineers, and the shortage of qualified personnel for public health engineering services.

#### Equipment for schools of nursing

An up-to-date list with prices of equipment suitable for a school of nursing had been prepared by WHO. It is intended primarily to guide field nursing staff in selecting essential equipment in accordance with local needs. Assistance in compiling the list has been given by nurses who have had experience in helping to plan and equip schools of nursing in countries other than their own. The list covers equipment for demonstration and practice rooms, lecture rooms, bacteriological and chemical laboratories, diet kitchens, offices and libraries. An attempt is made to indicate priorities for purchasing equipment, first priority being given to items needed when a teaching programme starts and second priority to those which should not be purchased until the teaching staff has had an opportunity to study local needs and facilities.

In its 67 pages, the list gives specifications for 719 items, together with a bibliography on the construction and planning of nursing schools and nurses' residences. At present it is being used experimentally and pending the introduction of modifications suggested by the users, exists only in mimeographed form.

## Atomic energy and society

WHO recently published the report of a Study Group on the Mental Health Aspects of the Peaceful Uses of Atomic Energy<sup>1</sup> which met in Geneva in 1957. A meeting to consider a closely related subject—the social and moral consequences of the peaceful uses of atomic energy—was held in Paris by UNESCO in September 1958. Professor Hans Hoff of the Psychiatric and Neurological Clinic University of Vienna represented WHO as an observer at the meeting which was attended by scientists and sociologists from some ten countries.

After reviewing the moral and cultural implications of the peaceful uses of atomic energy and their effect on the structure and development of society the meeting made recommendations for the future work of UNESCO in this domain.

## Social psychiatry and community attitudes

The value of mental health services whether preventive or curative is to a great extent dependent on the attitude of the community towards psychiatric patients and their treatment. This is particularly so in the case of modern methods of social treatment which keep the patient in touch with the community e.g. treatment at out patient departments and open door hospitals.

The WHO Expert Committee on Social Psychiatry and Community Attitudes met in Geneva from 20 to 25 October to discuss attitudes of communities in various parts of the world towards mental patients and psychiatric practice and to consider ways of fostering favourable attitudes in this connexion. The term "social psychiatry" was defined for the purposes of the meeting as "the treatment and prevention of mental ill health directed towards fitting the individual for a useful life in his social environment by offering him the necessary opportunities for establishing adequate contacts with society".

The members of the Expert Committee were Dr Stjepan Beilheim (Yugoslavia)

Dr Robert H. Felix (USA) Chairman  
Dr R. H. Hazemann (France)  
Dr A. S. Manugian (Lebanon)  
Dr Maxwell Jones (United Kingdom)  
Rapporteur Dr T. A. Lambo (Nigeria)  
Rapporteur Dr Fernando A. Quirós Madrigal (Costa Rica)  
and Dr Phon Sangsingkeo (Thailand)  
Vice Chairman Professor Otto Klineberg (USA) acted as consultant to the Committee and Dr E. E. Krapf (WHO) as Secretary.

## Teaching of preventive medicine

WHO is becoming increasingly concerned about the neglect of the preventive aspects of medicine in the curricula of medical schools. Last year a WHO Study Group discussed ways in which these preventive aspects might be included in the teaching of physiology<sup>2</sup>. More recently the WHO Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel met to review certain questions arising in the teaching of pathology which can profitably be studied from the preventive standpoint e.g. radiation injuries, pre-cancerous states, industrial diseases, traumatic injuries etc.

The members of the Expert Committee which met in Geneva in October were Dr A. P. Avtyn (USSR), Dr B. Castleman (USA), Dr J. B. Collip (Canada) Chairman, Dr G. H. Cooray (Ceylon) Vice Chairman, Dr G. Favilli (Italy), Dr H. Hamperl (Germany), Dr G. Payling Wright (United Kingdom) and Dr T. Yoshida (Japan). Dr E. Kohn (WHO) and Dr J. M. MacIntosh (WHO) were Joint Secretaries to the Committee.

## Organizing hospital laboratories

The subject of hospital laboratories was discussed by the WHO Expert Committee on Health Laboratory Methods which met in Geneva from 27 October to 1 November. The different functions of these laboratories according to the type and size of hospital were studied together with the factors to be taken into account in their organization. The training of personnel and the relationship

between hospital laboratories and public health laboratories were also discussed.

The members of the Committee were Dr J Desbordes (France) Professor J Horejsi (Czechoslovakia) Professor V S Mangalik (India) Professor J F Murray (Union of South Africa) Dr K B Rogers (United Kingdom) Professor J F Seitz (USSR) and Dr G Z Williams (USA). Dr H Eriesson (Sweden) was consultant to the Committee and Dr R Sansonnens (WHO) acted as Secretary.

#### Recommended requirements for smallpox vaccine

A WHO Study Group met in Geneva from 3 to 8 November to formulate requirements for smallpox vaccine which could be internationally recommended. These included control measures to be applied during manufacture as well as tests of the finished products and were drawn up so as to fit into the general framework of the series of Recommended Requirements for Biological Substances. The Group also discussed the early establishment of an international reference preparation for smallpox vaccine.

The following experts were invited to take part in the meeting of the Study Group on Recommended Requirements for Smallpox Vaccine: Dr J Desbordes (France) Dr D G Evans (United Kingdom) Dr R Gispén (Netherlands) Dr L Greenberg (Canada) Dr E Krag Andersen (Denmark) Dr U Krech (Switzerland) Dr A Lafontaine (Belgium) Dr R Muckenfuss (USA) Dr C Puranananda (Thailand) Dr G Renoux (Tunisia) Dr R Sanjiva Rao (India) Dr D McClean (United Kingdom) and Dr S S Marennikova (USSR) were consultants to the Study Group and Dr N K Jerne (WHO) was Secretary.

#### Study Group on Diarrhoeal Diseases

As the first step in a long-range programme for the control of the diarrhoeal diseases throughout the world a Study Group on Diarrhoeal Diseases was convened by WHD during November. The task of the Group

which met in Geneva was to examine present knowledge on the subject and to review preventive measures and means of reducing the high infant mortality from these diseases. An attempt was also made to arrange the various problems involved in diarrhoeal-disease control in order of priority for the purposes of the programme.

The following experts took part in the meeting: Dr Albert V Hardy (USA) Dr H M Penido (Brazil) Professor J Senécal (Senegal) Dr Joan Taylor (United Kingdom) Dr Dragomir Z Kacarevic (Yugoslavia) and Professor E M Linetskaya Novgorodskaya (USSR). Dr N K Ordway (USA) and Mr D J Schliessmann (USA) acted as special consultants to the Study Group. The Secretary was Dr N Ansari (WHO).

#### Pesticides and herbicides

The WHO Expert Committee on Specifications and Chemistry of Pesticides met in London from 19 to 26 November 1958 (a) to review the specifications for pesticides established by the Expert Committee on Insecticides in 1954<sup>1</sup> (b) to establish specifications for pesticides developed since that date (c) to consider specifications for some of the newly developed herbicides and make recommendations for their use in public health programmes and (d) to consider other chemical problems such as the sorption of insecticides on mud walls.

The following experts served on the Committee: Dr M E Alessandrini (Italy) Dr H L Bami (India) Dr Abdel Aziz Fathi (United Arab Republic) Dr R A E Galley (United Kingdom) Dr E Paulini (Brazil) Dr G W Pearce (USA) and Dr J Treboux (Switzerland). Mr J Wright (WHO) was Secretary to the Committee.

#### Mental health problems of automation

The effects of automation on the individual worker, the family, the local community and national institutions were discussed by the WHD Study Group on the Mental Health

<sup>1</sup> See World Health Organization Expert Committee on Insecticides (1958) Specifications for pesticide insecticides, acaricides and spraying and dusting apparatus.



Problems of Automation which met in Geneva from 10 to 15 November to study means of preventing or allaying the wide spread anxiety aroused by this technical innovation

The members of the Study Group included psychiatrists psychologists and human relations experts They were Professor C M Arensberg (USA) Vice Chairman Dr H C

Ganguli (India) Mr A Lucas (France) Rapporteur Professor V N Myasishchev (USSR) Professor A C Pacheco e Silva (Brazil) Professor J Parisot (France) and Dr A T M Wilson (United Kingdom) UNESCO Representatives of ILO and UNESCO were also in attendance The Secretary to the Study Group was Dr E E Krapf (WHO)

## People and Places

### Production of dried smallpox vaccine

As a result of research carried out under WHO auspices it is now possible to prepare a high potency stable dried smallpox vaccine capable of standing up to tropical conditions for long periods without losing its efficacy Dr D A Cannon recently spent five weeks as WHO consultant in India and Indonesia advising laboratories on the production of this vaccine A graduate of the University of Glasgow and of the London School of Hygiene and Tropical Medicine Dr Cannon has worked for many years as a pathologist and bacteriologist with the Federal Laboratory Service Yaba Nigeria

### Rabies control

As recently as 1956 149 deaths from rabies were reported in the Americas and it is possible that the actual number of deaths due to this disease was far higher One of the main tasks of the Zoonoses Center established by the Pan American Sanitary Bureau (WHO Regional Office for the Americas) at Azul Argentina is to co-ordinate efforts for the control of rabies throughout the Region

Dr Karl Habel a staff member of the Center recently spent six weeks visiting areas in the Region where rabies is a particular problem During his tour which took him to Argentina Brazil Chile Panama and Peru he had discussions with government health and agricultural authorities and with heads of health laboratories and institutions on ways of controlling the disease Dr Habel is a leading research scientist and authority on rabies He has served on the WHO Expert Committee on Rabies and is the originator of the widely used Habel test for virus potency

### Social psychology

As part of its long term programme for the training of psychiatrists and mental health personnel in general WHO has begun to examine the place of

social psychology in psychiatric studies Professor Jean Stoetzel Professor of Social Psychology at the University of Paris was recently engaged by WHO as a short term consultant on this question Educated in France and at Colombia University in the United States Professor Stoetzel is President of the French Institute of Public Opinion

### Exchange of teachers

As already mentioned in the Chronicle (September 1958) WHO is co-operating in the organization of an exchange programme between members of the teaching staffs of the Institute of Hygiene University of the Philippines Manila and the Johns Hopkins University School of Hygiene and Public Health Baltimore Md USA

Under this programme Dr Marcia Mann Cooper has taken one year's leave of absence from her post as Assistant Professor in Mental Hygiene and Public Health at Johns Hopkins University to serve as WHO Lecturer in Mental Health at the University of the Philippines Dr Cooper is a Doctor in Science of Johns Hopkins University where she studied child psychology and carried out research on mental hygiene in public health

### Ophthalmologist for Cambodia

For the past five years WHO has been helping the Royal School of Medicine Phnom Penh Cambodia to improve its teaching standards and to expand its facilities for the training of hospital assistants Dr Bernard Lépine has just been appointed WHO consultant in ophthalmology to the School where he had already worked as medical officer and ophthalmologist in 1956 Before joining WHO Dr Lépine was Externe des Hôpitaux de Paris specializing in ophthalmology

### Training of sanitary engineers

Mr A E Williamson of the United States has been appointed WHO Visiting Professor of Sanitary Engineering at the American University of Beirut

for a period of two years. In this capacity he will help to strengthen undergraduate and post graduate teaching courses in sanitary engineering and the facilities provided for these courses.

Educated at the Universities of Maryland and North Carolina, Mr. Williamson has held a number of important positions including that of Senior Sanitary Engineer of the US Public Health Service. This will not be his first visit to Lebanon since from 1952 to 1955 he was Chief Sanitary Engineer of the United States Operations Mission (USOM) to Lebanon, and then Chief of the Mission's Public Health Staff. From 1956 to 1958 he held a similar position in Haiti.

### Hospital administration in Malaya

In 1955 the Government of Malaya asked WHO to review the country's system of hospital administration and to establish a school for advanced training in this branch. This school is now about to give its first course under the leadership of Mr. E. John Ruzos of the United States. The pupils will be administrators from the seven principal hospitals in the Federation.

Mr. Ruzos has been administrator of a number of private hospitals in the United States. His last post was with the Hollywood Presbyterian Hospital, Los Angeles.

### Public health mission to India

For some time WHO has been helping the All India Institute of Hygiene and Public Health, Calcutta, to improve and extend its training services. A team of three experts provided by WHO recently completed six weeks' visit to Calcutta to consult with the Director of the Institute on plans for its future development. They were Dr. W. G. Y. Anderson, My Professor and Director, School of Public Health, University of Minnesota; Dr. Thomas McKeown, Professor of Social and Preventive Medicine, University of Birmingham; and Dr. C. A. Bozeman, Director, Wellcome Museum of Medical Science, London.

### Planning environmental sanitation programmes

At the Eleventh World Health Assembly a number of delegates drew attention to the continued lack of adequate environmental sanitation in many parts of the world. The Assembly therefore asked the Director-General to make comparisons and review of the work of WHO in helping Member States to plan environmental sanitation programmes with particular reference to the possibilities of improvement

of water supplies and the adequate disposal of human wastes.

A group of four consultants has now been appointed to prepare this review which will be submitted to the Twelfth World Health Assembly. They are Professor Abel Wolman, Professor of Sanitary Engineering at Johns Hopkins University, USA; Mr. Clarence W. Klassen, Chief of Sanitary Engineering Department of Public Health, State of Illinois, USA; Mr. Walter Sanchez, Deputy Director, Special Public Health Service, Brazil; and Mr. William E. Wood, Chief of Water Engineering Ministry of Works, Northern Nigeria.

### Malaria field appointments

WHO is helping the Government of Sarawak to train personnel for the eventual eradication of malaria from the territory. Dr. Ian D. Carter, who has been appointed Medical Officer to the project, comes to this post from the Pan American Sanitary Bureau (WHO Regional Office for the Americas) in Washington where he has been working as malaria statistician. Dr. Carter was educated at the Universities of Adelaide and Sydney, Australia, and has carried out postgraduate studies in England at the Liverpool School of Tropical Medicine and Hygiene and in the United States at Johns Hopkins University.

Dr. Fung Yung Cheng has been chosen as entomologist to WHO-assisted malaria eradication project which is to start in Korea in 1959. Dr. Cheng was educated in Canton, China, subsequently undertaking postgraduate studies in biology at Harvard University in the United States. Prior to his assignment with WHO he was Professor of Entomology at the National Taiwan (China) University in Taipei.

A practical outcome of WHO's efforts to encourage countries with common frontiers to co-ordinate their malaria activities has been the establishment of an Anti-malaria Co-ordination Board for Burma, Cambodia, Laos, the Federation of Malaya, Thailand and Viet Nam. Dr. Wolfgang H. Huehne was recently appointed Secretary to this Board and took up his duties in October. Educated at the University of Berlin, Dr. Huehne is a specialist in entomology and parasitology at the Berlin Institute of Tropical Medicine. He has been in charge of antimalarial campaigns in Corsica, Italy and Sardinia and, prior to his present assignment, was team-leader of the WHO-assisted malaria project in Sarawak.

Mr. William Tamm has been appointed sanitarian to the WHO-assisted malaria eradication project in North Borneo. Mr. Tamm, who recently completed a special WHO course in malaria eradication in London and Iraq, has already served the organization as sanitarian in charge of a rural sanitation project in Afghanistan. A former health inspector

in the Medical Department of the Hong Kong Government he has also worked as Health Supervisor of the Municipality of Kuala Lumpur Malaya

#### Nursing appointments

Miss Louise Bell has been appointed Nursing Adviser to the WHO Regional Director for Africa with the task of analysing and assessing nursing and midwifery needs and advising on nursing education throughout the Region. She will also help to establish guides and criteria for WHO assisted nursing and midwifery programmes and advise on the nursing aspects of public health programmes. Miss Bell who received her Sister Tutor's Diploma from the Royal College of Nursing London is a former member of the Nursing Service in Tanganyika and since 1952 has been Principal Tutor at the School of Nursing University College Hospital Ibadan Nigeria.

A WHO nursing team is at present in Singapore to help the Government in the planning and development of a post graduate programme in public health nursing at the Institute of Health. The newest member of the team is Miss Dorothy Goodwin of the United Kingdom. Miss Goodwin has had considerable training and experience in various branches of nursing and has served as Deputy County Nursing Officer in Cornwall and as Education Officer at the Queen's Institute of District Nursing London.

#### Sanitary engineers for Morocco Tonga and Syria

WHO is at present advising the Government of Morocco on the improvement of rural sanitation and the training of public health personnel for health and community development programmes. Mr Raymond Carrié a sanitary engineer from Haiti is to assist in the development of this project. Mr Carrié graduated from the Haiti Polytechnic School and took a post graduate degree in Sanitary Science at Colombia University New York. He has had wide experience of various types of rural sanitation work in Haiti where he has also taken part in the training of sanitarians.

With WHO assistance the Government of the Kingdom of Tonga is organizing a pilot project for the training of public health workers in environmental sanitation methods and procedures. Mr Howard F. Hoffman of the United States took up his duties as sanitary engineer to this project at the end of October. Educated at the Rensselaer Polytechnic Institute Mr Hoffman was senior public health engineer in the Department of Health of Utica City New York before joining WHO.

WHO has undertaken to help the Government of the United Arab Republic with the planning and development of a programme of environmental sanitation for the Province of Syria. Mr Luis Miguel, of Bolivia has been appointed sanitary engineer to this project. Mr Miguel is a graduate of the Universidad Mayor de San Andres La Paz and has studied sanitary engineering at the University of North Carolina in the United States. He has had extensive experience in the planning design and construction of water and sewerage systems in his own country where he served as Chief Engineer of the Hydraulic Section of the Ministry of Public Works and as Director of the Sewer Department of the Municipality of La Paz.

#### Health education of the public

In connexion with a five year plan for the development of public health services in Afghanistan Miss Emma Carr Bivins has been appointed WHO health education adviser to the Ministry of Health in Kabul. Miss Bivins has served for several years as Director of Education and Information for the American Cancer Society in Raleigh N.C. USA.

Another WHO health education adviser Mrs Annie Ray Moore is at present in India helping the Government to develop its programme of health education in schools. Mrs Moore who comes to this assignment from the North Carolina State Department of Public Instruction USA has already served WHO as health education adviser in Burma in 1955/56.

#### New Area Representatives for India and Indonesia

Dr J. F. Castillo of Chile has been appointed WHO Area Representative in India. In this capacity he will keep in touch with the health needs of the country and advise the WHO Regional Director for South East Asia on the development of schemes for WHO assistance to India. He will co-operate with the Indian Ministry of Health in helping to prepare a co-ordinated WHO assisted programme from year to year and will also co-ordinate the activities of individual WHO field workers of whom there are almost fifty attached to different projects throughout India. Dr Castillo's public health experience extends over a period of more than twenty five years during which he has held important positions in the Chilean health services. For the past few years he has been Senior WHO Officer in Ecuador.

Indonesia also has a new Area Representative in the person of Dr James Deeny of Ireland whose duties in Indonesia will be similar to those of Dr Castillo in India. Dr Deeny was educated at

Queen's University Belfast and the Royal College of Physicians Dublin and has been Chief Medical Adviser to the Irish Department of Health for the past fourteen years. He led the Irish delegation at the First and Tenth World Health Assemblies and has served on the WHO Expert Advisory Panel on Public Health, the Joint FAO/WHO Expert Committee on Nutrition, and the WHO Expert Committee on Auxiliary Dental Personnel.

#### Changes at WHO Headquarters

The retirement is announced of Dr W. A. Timmerman, Assistant Director General of WHO in charge of Central Technical Services. Dr Timmerman has been with WHO since 1950 when he was appointed Director of the Division of Therapeutic Substances. He became Assistant Director-General in 1957.

Dr Timmerman has had a long and distinguished career in the fields of bacteriology, biological standardization, and the control of pharmaceutical substances. Born in The Hague in 1893, he studied at the University of Leiden and worked for several years at the Pasteur Institute of Bandung, Java, subsequently becoming Director of the Netherlands National Institute for Public Health.

Dr Emilio Pampana, Director of the Malaria Eradication Division at WHO Headquarters, has

retired after more than eleven years' service with the Organization. Born in Florence in 1895, Dr Pampana studied at the University of Florence and the London School of Hygiene and Tropical Medicine. He subsequently served in the Health Division of the League of Nations and as Head of the Department of Epidemiology, Institute of Malariology, Rome. Between 1943 and 1947 he was Director of the Health Bureau of the League of Red Cross Societies. He then joined WHO, serving as Chief of the Malaria Section until 1957 when he was appointed Director of the newly created Division of Malaria Eradication.

Dr Pampana's successor is Dr Carlos A. Alvarado, formerly Chief of Malaria Eradication at the Pan American Sanitary Bureau (WHO Regional Office for the Americas). After taking his M.D. at the University of Buenos Aires, Dr Alvarado studied tropical medicine in Rome and London. He was Director-General of the Department of Malaria and Tropical Diseases in the Argentine Ministry of Health from 1937 to 1949 and was subsequently appointed Director General of Public Health for North Argentina.

After more than seven years' service with WHO Headquarters where he was Chief of the Section of Assistance to Educational Institutions, Dr J. L. Troupin has left to take up an appointment as Associate Director of the Committee on Professional Education, American Public Health Association, New York.

## Review of WHO Publications

### COMMUNICABLE DISEASES

*Bulletin of the World Health Organization*  
1958 Volume 19 Number 4 (pages 589-758)

Malaria—or more specifically malaria eradication—is the subject of the first two articles in this issue of the Bulletin. The aim of all the antimalaria campaigns in operation today is to interrupt transmission of the malaria parasite by breaking the weakest link in the epidemiological chain—the mosquito—before anopheline resistance can intervene and threaten the success of the spraying programme. The degree of success

achieved so far in Taiwan, where an eradication campaign was begun in 1955, is assessed in the opening contribution—a report prepared jointly by the Taiwan Provincial Malaria Institute and the WHO Malaria Team in Taiwan.<sup>1</sup> The eradication operations now under way in Mexico are being directed by the National Committee for the Eradication of Malaria, which was created at the end of 1955. In their paper, L. Vargas and his co-workers at the Evaluation Office, Public Health Experimental Studies Administration, Government of Mexico, give an outline of the

<sup>1</sup> Summary of this paper appeared in *Wld Hlth Org* 1958 12: 73.

organization of this committee and describe the work of the Evaluation Office which carries out independent analyses and makes recommendations on the operations

In the case of bilharziasis also control campaigns aim at breaking the chain of transmission by attacking the intermediate link—in this instance the snail host of the schistosome. But as R C Muirhead Thomson points out in his paper while the last few years have seen heartening advances in the control of malaria they have witnessed a distressing lack of progress in the control of bilharziasis. In fact far from being held in check this disease is being aggravated in many areas by irrigation schemes. The dearth of information on the habitats of the intermediate hosts of the parasite is one of the most serious obstacles to successful control. Muirhead Thomson reviews the present knowledge of snail ecology in the light of the much more extensive information available on mosquito ecology.

Before a snail-control campaign can be introduced reliable information on the size and seasonal fluctuations of the snail population in question must be obtained. Obviously no standard method applicable to all situations can be developed for estimating snail populations. The choice of survey technique and sampling device must depend on the objectives of the study the circumstances in which the work is carried out the nature of the habitat and the resources available. N G Hairston B Hubendick J M Watson & L J Olivier present an evaluation of the techniques currently employed.

The relationship between the louse borne and the tick borne agents of relapsing fever is little understood. Early in 1955 a study on relapsing fever was carried out in Ethiopia on behalf of WHO by Helene Sparrow who reports on the results of her mission in the next article. The examination of 15 strains of relapsing fever spirochaetes isolated in the high plateau region showed them all to belong to the louse borne type *Borrelia recurrentis*. On the other hand an investigation in the lowland districts revealed the presence of the tick borne variety. The author suggests that further research should

be conducted to delimit the vast focus of louse borne relapsing fever in Ethiopia and through studies in the lowland regions to determine whether transitional forms between the louse borne and the tick borne spirochaetes occur there.

The next three contributions all bear on brucellosis. The first—by S S Elberg & K F Meyer—summarizes the results of experiments on the isolation properties and behaviour of a strain of *Brucella melitensis* recently developed at the University of California for use as an immunizing agent. A series of studies in goats using heat killed as well as living cells of the strain showed that the live vaccine was markedly more effective than the killed vaccine.

Knowledge of the different species of the causative organism is essential to the complete understanding of any communicable disease. In the case of the genus *Brucella* the speciation problem is at present the cause of much confusion in the minds of authorities dealing with both laboratory and field aspects of brucellosis. The conflicting viewpoints are well exemplified in the papers by N B McCullough & G A Beal and G Renoux the former authors maintaining that *Br melitensis*, *Br abortus* and *Br suis* are distinct and stable species the latter holding that only *Br melitensis* is a true species all other strains being merely varieties.

Polio-myelitis is the last subject to be dealt with in this issue of the Bulletin. A few years ago a comparison of the infant mortality rates and the polio-myelitis case rates in several European and North American countries over a number of years revealed the interesting fact that the rates of the disease usually rose as the infant mortality rate fell. In the final article<sup>2</sup> J R Paul studies the position in Central and South America and shows that by and large the inverse ratio between infant mortality rates and polio-myelitis case rates is holding there also.

The list of contents will be found in the advertising section at the end of this number of the Chronicle.

# ARTICLES AND STUDIES ON THE WORLD HEALTH ORGANIZATION 1946-1957

Since early 1947 the Chronicle has kept its readers regularly informed of the more important aspects of the work of the World Health Organization. As a WHO publication, the Chronicle naturally reflects the facts as seen from within the Organization. During the same period, however, there have been a great many other publications on WHO which have discussed international health work from a more or less independent point of view. On the occasion of the tenth anniversary year of WHO a bibliography of such works—books, theses, articles and important editorials—has been prepared by the Organization's Library and Reference Section. This list of articles and studies on WHO which is reproduced below covers the period from 1946 to the end of 1957. Publications of the United Nations and specialized agencies, including WHO, are excluded, as well as reviews of WHO publications, reports of meetings, news items, reproductions of WHO press releases and similar material. It is hoped that readers of the Chronicle will find valuable sources of reference in the publications mentioned below.\*

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Every effort has been made to make this list as complete as possible, but additions and corrections will be welcome and should be addressed to Library and Reference Section, World Health Organization, Palais des Nations, Geneva, Switzerland.

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